

# COAL AGE

Vol. 2

NEW YORK, OCTOBER 26, 1912

No. 17

INDUSTRY is the right hand of fortune. The man who lives on hope rather than hard work will die fasting. True success is only won through long hours of unceasing toil—through labor that does not begin and end with the toot of a company whistle. Of course, there's "room at the top," but who of us ever found the elevator running?

And whether the condition of involuntary slavery under which we all serve is desirable or not, the fact remains that the world is being made by men who work overtime. The fellow who receives \$100 a month, and who complains that he labors just as hard and just as long as the manager who is paid \$10,000 a year, neglects to consider that the latter boss gets his high salary for the ideas he evolves and the schemes he perfects while walking, riding and resting.

No man ever observed the eight-hour day rule and had his name illumine the pages of history. A lot of fellows come into the millions rounded up by the unremitting toil of their hard-fisted, iron-willed forbears, but their fame and deeds are confined almost entirely to the society pages of Sunday newspapers and current literature.

We are not opposed to the enforcement of a minimum wage, or at variance with laws stipulating maximum hours of labor,—for such acts may be necessary to protect the toiler against the few unscrupulous mine owners, who would not hesitate to sacrifice the manhood of their employees on the altar of sweated dollars. But when a workman is elevated from the ranks to a position of authority over others, then he has graduated into a class where "personal success" and "limited hours of labor" don't even speak when they pass by.

The fellow who can increase production without loss in efficiency or grade is the man who will get the

fat salary. To survive competition it is necessary to enlarge output or improve quality, and this can't be done by the boss who works only eight hours, six days, for one week's pay.

There is a limit to what a human can earn through laboring with his hands; the real money today goes to the man who toils with his head. Prescribed working hours are a period for observation and supervision; the best time to review facts and manufacture ideas is after the nominal day's work is done. Incessant workers live longest and are happiest. More men rust out than wear out.

The exercise of common sense and quick decision in our daily work are as essential to success as oil to machinery or current to a motor, but above all is the quality of detailed analysis and ability to burn the midnight candle. Every hour has its own special work, and once gone will not return. Time never labors; it eats, undermines, rusts and destroys, but it never slaves. It only gives us an opportunity to work.

Lost wealth may be regained by industry and economy, lost knowledge by study and reflection, lost health by temperance and medicine, but lost time is gone forever.

Some men make more out of the odds and ends of opportunities which are by many carelessly thrown away, than others get out of a whole lifetime. One hour a day withdrawn from frivolous pursuits and profitably employed would enable any man of ordinary capacity to master a complete science, or make an ignorant man well-informed in ten years.

*The fellow who is always refusing to be anybody's slave seldom gets to be anyone's master.*

# Ideas and Suggestions

Interesting Talks Submitted in Response to Our Recent Request for Forewords.

## Why Coal Mining Is Unpopular

BY AN ANTHRACITE CORRESPONDENT

There are persistent and justifiable complaints among mine foremen throughout the anthracite regions that it is becoming more difficult every day to secure an adequate and efficient working force for the mines. While all the more productive mines can secure as many miners and mine laborers as they need just at present, it is far otherwise at mines where the seams are nearly worked out or where the geological formation prevents the average miner producing as much coal as he believes brings him an adequate recompense for the labor expended in procuring it.

### SHORTAGE OF MEN

The situation as it stands is not at all satisfactory, and the outlook is even more serious. The tide of immigration to the anthracite regions from central and southern Europe is comparatively insignificant at present, and the bill which is now presented in Congress would reduce it still further. The proposed legislation makes the qualifications of an admitted foreigner yet more stringent and if the enactment becomes law, many of the less remunerative mines may be compelled to shut down altogether for lack of men. This will increase the price of anthracite coal in a manner which neither Congress nor courts will be able to obviate.

I believe that there has never been an epoch in the history of anthracite mining when the occupation of miner was so unpopular as it is today. In the ordinary acceptance of the word, mining was not and is not a popular calling, apart altogether from the dangers incidental to it. Too much lachrymose sympathy has been showered upon the "poor miner," by a public ignorant of the actual conditions under which he works.

### MINER ASKS FOR NO SYMPATHY AND INDEED NEEDS NONE

Where sympathy is misplaced, and that systematically, it has a tendency to degrade the recipient of it in his own eyes, to imbue him with the idea that he is the slave of his circumstances, and it predisposes him to despise an industry which calls forth on every hand so many ebullitions of emotional commiseration for those engaged in it. The comparatively high wages which the average

miner and mine laborer earn have done and are doing little or nothing to mitigate the unpopularity of mining.

I know that miners themselves have no exaggerated idea of the dangers which they incur underground, and I know moreover, that they are well aware that their wages are higher on the average than those of men employed in occupations or industries where the danger to life and limb is just as great and imminent, and where discipline is infinitely more severe.

### AMERICANS LEAVE MINES FOR MORE RISKY OCCUPATIONS

Railroad offices are flooded with applications from young men desirous to become brakemen or firemen, young men, too, whose fathers and grandfathers worked in the mines, made moreover, a fair living in them and finally died in their beds. It is a rare thing for a mine foreman to have an application from a young American desirous to follow the occupation of miner. One informed me a few days ago that not in months had he received such an application, nor did he expect any.

This foreman may or may not be an exception, but it is undoubtedly a fact that it is far rarer to find a young fellow seeking a job at the office of a mine foreman than it is to find them applying for admission to the army at the United States recruiting offices where these have been established in the anthracite regions, and there is no lack of them from one end of our coal fields to the other.

### NO MORE GRADUATES FROM THE BREAKER

The breaker was a school for miners of a very practical sort. Some of the most qualified mine workers, some of the best mine foremen, even some of the most efficient mine superintendents were recruited from the breaker. But modern machinery has almost eliminated the breaker boy. I am merely stating a fact, I am not discussing, the moral or economic conclusions associated with the bald, yet incontrovertible statement that the breaker was the door to the mine and for the boy that door is largely closed.

In taking stock of the manning of the mines, we must consider the natural and accidental attrition which is depopulating them, and the difficulty of replenishing the working mining population from the sources which were formerly available. This is a matter which does not affect the operators and the coal companies alone; it affects the nation, and af-

fects it in its most vital interests, its domestic comforts and necessities, and its manufacturing and transportation services.

### CONGRESS EXCLUDES THE FOREIGNER

The congressional hayseeds who imagine that there is no other fuel than cornstalks will have no hesitation in voting for any bill excluding the foreigner or rendering immigration more difficult, if it serves his immediate political exigencies. We can make up our mind to that fact. But as long as coal must be dug from the bowels of the earth, we must have men to dig it, and it is useless to clamor at the high price of coal while demagogues are through legislation barring out the very men who are willing to raise it to the surface.

There is practically no help for this situation, which is created by our national enactments. We can only grin and bear it. Our Canadian neighbors do not think it an essential prerequisite of an immigrant who raps at their door for admission, that he should be able to read in English "God Save the King." They are content with the qualification that he has the physical characteristics which will enable them to increase the exploitation of the natural resources of their country.

They believe and rightly that he will acquire political aptitude soon enough. Not a few of our most domineering and efficient grafters have come to the United States quite unlettered in our English tongue.

### DECREASE IN FATALITIES HAS NOT INCREASED DESIRE TO ENTER THE MINES

For some years past, our leading mining companies have worked assiduously to alleviate the position of the miner, to educate him and to lay open to him the road to promotion. I do not think that these efforts have adequately fulfilled the expectations which many have formed of such systematized enthusiasm and practical application of means to end.

It is true that when all is said and done, fatalities in mining have steadily decreased within the past ten years or so. While the decrease in fatalities is not as large as it should be, the diminution in accidents which do not result in fatalities, or at least not necessarily so, has been, on the whole, satisfactory.

The hideous and lumbering ambulance, which, not so very many years ago, was almost every day dragged out of the shed

to convey some poor bruised or mutilated miner to the hospital, is becoming less conspicuous in the streets of the anthracite towns and villages, and sometimes is not called out in weeks. But for all that the unpopularity of mining is increasing significantly.

I confess I am at a loss to suggest a remedy. I know of one large high school where three-fourths of the students attending its classes are the sons of miners—I do not speak of the daughters. Each of these boys has turned his back forever to the mines. It is not merely

one member of the family who has acquired a loathing for mining—the whole family is inoculated with a vague repulsion from any association with the mines, direct or indirect. You may attribute this to what you will, but we are confronted with the condition.

In my opinion, I think it would not be a bad idea for mine corporations to establish scholarships in our universities open to boys and young men only who have worked in the mines with the prospect of graduating in mining engineering, and that all positions from fireboss to

superintendent should be the reward of a life identified with the mines.

There is an impression among young men whose forebears were miners, that all promotion at the collieries goes by favoritism, and there will be no future for them, such as was always open to their predecessors. They feel the "pick and shovel" is their sole future should they take to mining. There is a good deal of truth in this assertion, notwithstanding the fact that innumerable instances may be adduced to show that the rule does not always hold good.

## Economy in Tipple Construction

By Robert F. Powers

For those who find the timber tipple more desirable and economical than the more modern steel and concrete structure, let us ascertain if it is not possible to improve on the old methods of 25 years ago. These have experienced little change during this period, and it seems that a more economical form of construction might be devised.

### THE INCREASING COST OF LUMBER

We are constantly being warned of the increasing scarcity of good timber, and we have only to observe the steadily ad-

But, consider the immense waste. These parts would carry 125 to 150 tons easily, and with bents spaced only 14 ft. apart, the inconsistency of the design is obvious. Of course, for stringers and beams the loads are determined and the proper size timbers used, but such is not the case with posts and braces, these latter also being far in excess of what is really necessary, to insure a perfectly rigid structure.

Now take the case of the post referred to, and substitute for the single 10x10 two, 3x10-in. planks with a 3-in. open

and may seriously delay the work. On the other hand, planks can be obtained at mills in almost every locality, delivery is prompt, cost low, and where long posts are required a splice is easily made.

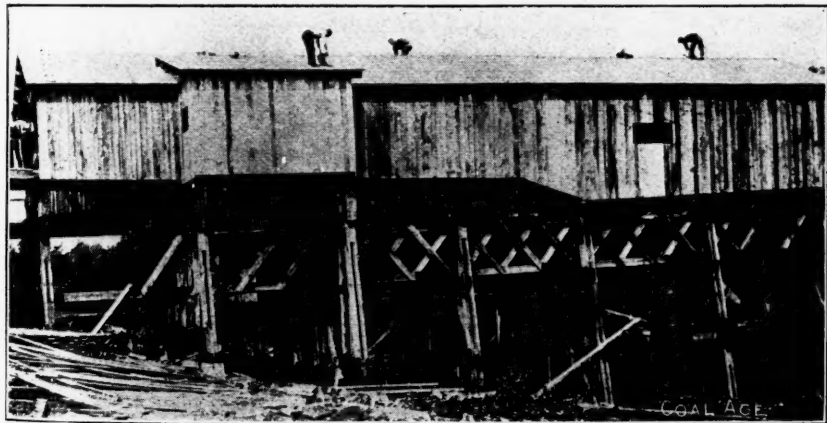
Again, joints are fully exposed and can be readily inspected at all times, so that if any parts become damaged or decayed they can be replaced one at a time without putting the tipple out of service as would be necessary if the entire bent were taken down.

The dangerous condition known as "dry rot" in large dimension timber cannot be detected until the entire piece has collapsed and the bent failed completely. Such could not occur in two relatively thin planks.

Then, too, in construction and erection the lighter pieces are much easier to handle and only an average mechanic is required, whereas none but a first-class carpenter can make a good mortice and tenon joint.

### SOME EXAMPLES OF RIGIDITY

As an example of the strength of this class of construction, the following accidents, which occurred on tipples built along these lines, may be cited: On one tipple was a sheave around which the 1½-in. rope of an endless haulage system turned a right angle. The rope once caught on an obstruction in the mine and the resulting stresses were so great that the sheave was displaced 12 in., the engine drum crushed and the rope tore a slot in the brick wall of the engine house. The bent, about 28 ft. high, built of 4x10-in. planks, bolted together, was not affected. Another tipple bent of this type, 33 ft. high and built of 4x12-in. plank in two stages, with no longitudinal bracing whatever, was struck by a falling screen which sprung the legs 6 or 8 in. at the middle. They came back immediately to their original position and not a stick was split. What would have happened to mortice and tenon joints in this case is easily imagined.



VIEW SHOWING THE COMPOSITE TYPE OF CONSTRUCTION

vancing price to have this brought home to us. We are too apt to allow the common methods of years back, to guide us in determining our type of construction, neglecting the fact that, while such are effective, they are also wasteful, being designed when timber was plentiful and economy of material was seldom considered. Take, for example, the ordinary tipple bent, using perhaps five or six 10x10-in. posts or legs; if the tipple is only moderately high, such a size is usually thought necessary to insure stiffness to the structure and obtain sufficient cross-section to provide against failure by crushing at the joints.

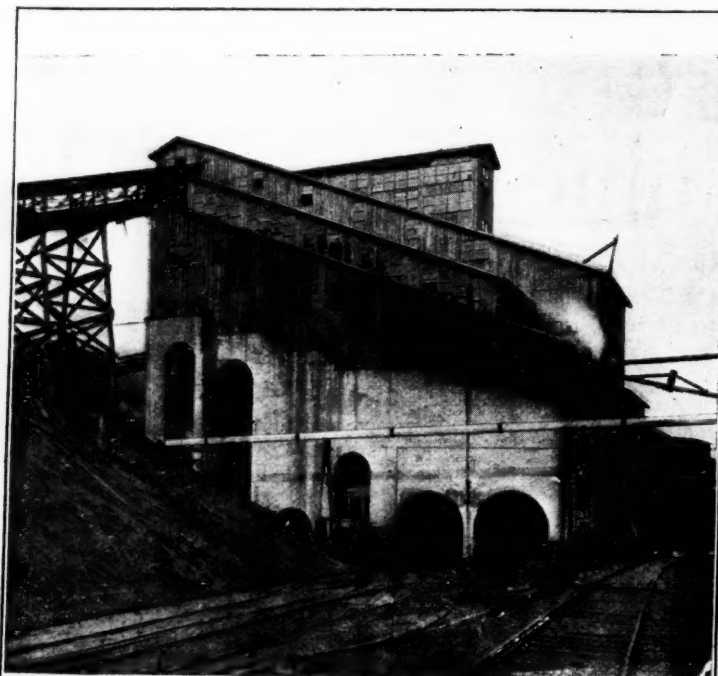
space between. If we make the cap and sill the same, instead of having mortice and tenon joints (always concealed and consequently of doubtful strength, not to mention the skilled labor required) we can bolt a 3x10-in. tongue 3 ft. long in the open space and have a positively rigid joint. This open space also provides a good place to bolt 3x10-in. sway bracing and as a result we have as stiff a structure as can be made, of ample strength and with 40 per cent. less timber.

This composite construction has other advantages also. The larger size timbers are nearly always hard to obtain in long sticks which adds appreciably to the cost



# Snap Shots in Coal Mining

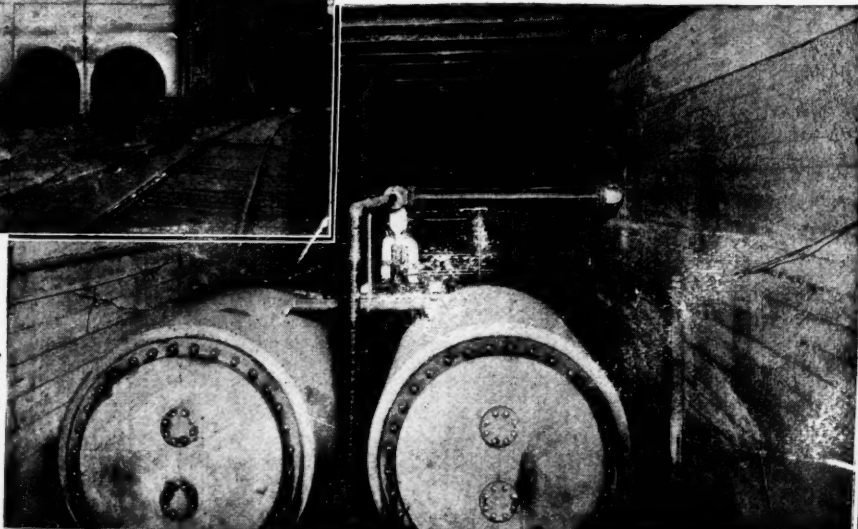
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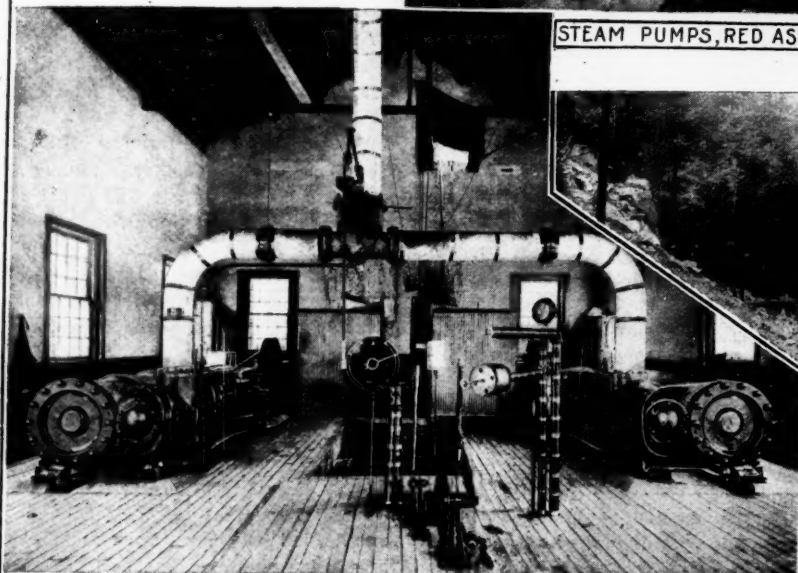
COAL BREAKER, PINE HILL COLLIERY  
NEAR MINERSVILLE, PENN



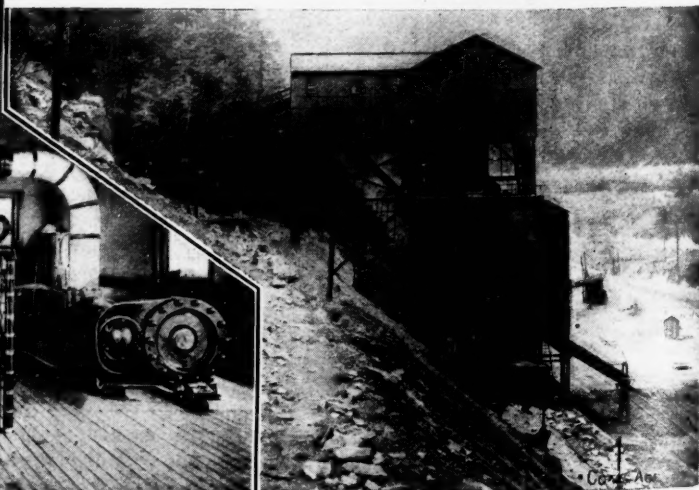
THE RENTON MINE, OF SEATTLE ELECTRIC CO.  
AT TAYLOR, WASH



STEAM PUMPS, RED ASH VEIN. D.L. & W. R.R. CO'S WOODWARD MINE.



VULCAN HOISTING ENGINES, TOWER-HILL CONNELLVILLE COKE CO.  
REPUBLIC STATION, PENN.



STEEL TIPPLE AT No 2 WORKS, OF U.S. COAL & COKE CO., GARY,  
W. VA. LINK BELT CONVEYOR OPERATED BY GENERAL ELECTRIC MOTOR.



# German Electric Mine Locomotives

Mining work demands, it is obvious, an entirely different type of locomotive to that used for other classes of work. A special type of locomotive for underground traction was therefore developed at a comparatively early stage of electrical engineering.

## FACTORS AFFECTING UNDERGROUND DESIGNS

The main factors to be considered were: The gage, sometimes as narrow as 450 mm. (17.71 in.), which determines the size and therefore the output of the motor which can be mounted between the wheels; the section of the smallest heading, the height and width of which sometimes restrict the overall construction to given dimensions; the small carrying capacity of the underframe which makes low wheel pressure and slow speed desirable, and finally the conditions generally prevailing in a mine, which call for an adequate protection against dirt, moisture and rough handling.

The locomotive shown in Fig. 1 may be taken as typical of the best German practice. All parts lie inside the cast- or wrought-iron frame and are thus pro-

By A. Gradenwitz \*

The German practice is in general like that used in our more modern plants. Three-phase current is generated at the surface and changed to direct current underground. The final voltage, however, is usually from 250 to 300 volts. Sometimes single-phase locomotives are used without, however, any manifest advantage. Accumulator locomotives are installed where overhead or third-rail conductors are not feasible. These are sometimes built with a "feeler" frame ahead, which shuts off the power when an obstruction is encountered. Thus no motormen are required.

Gosslerstrasse, 20, Berlin-Friedenau.  
Note—Abstract of article which appeared in "Engineering and Mining Journal."

by a sheet metal wall which has a window in it.

A powerful wrought-iron buffer bar

provided for lubrication and this is filled through an opening in the bearing cover. This grease box contains a lubricating pad which is pressed against the journal by springs.

The frame is supported on the axle bearings by leaf springs, special precautions being taken to prevent them from being displaced. Among other mechanical equipments are: A powerful quick-acting hand brake, which can be released immediately by a pedal; a sand-strewing device, and a signal gong.

## ELECTRICAL DETAILS

The motors are of the series type, are totally inclosed and run at a low speed. They are mounted on the axles and are spring-suspended from the frame. They drive the axles from single-reduction gearing which is likewise inclosed. The motors are regulated by a controller in conjunction with resistances. The speeds are so designed that after the starting period both motors are connected in parallel, so that when making a straight-away run they give their full output at a predetermined speed.

On the other hand, for shunting service, the motors are connected in series,

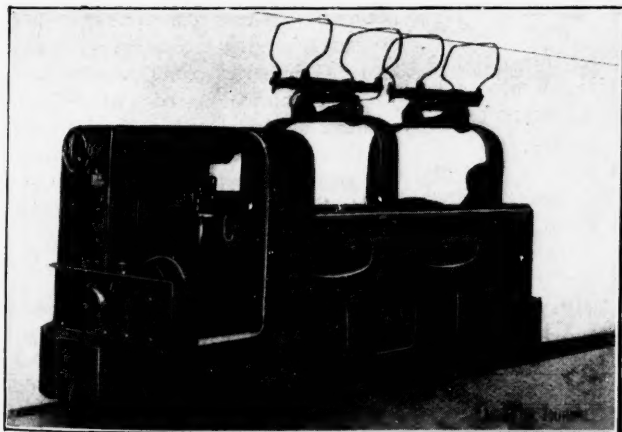


FIG. 1. A GERMAN DIRECT-CURRENT MOTOR WITH SMALL BOW CURRENT COLLECTORS

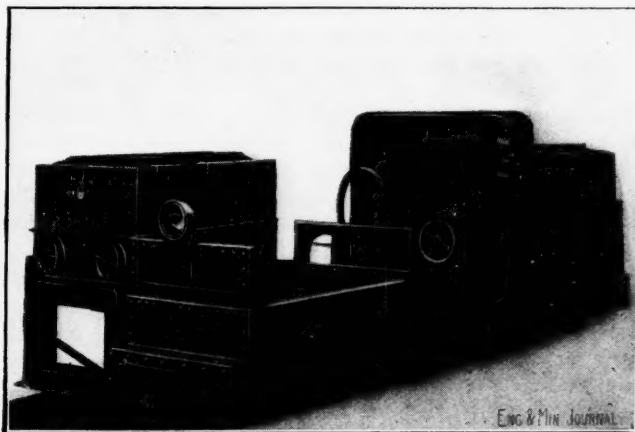


FIG. 2. UNLOADING STORAGE BATTERIES ONTO A PLATFORM AT THE CHARGING STATION

tected from injury which might otherwise be caused by objects accidentally projecting into the locomotive profile. They are provided with a drawbar link fitted with a strong spring. This link is easily interchangeable, being similar to those used in coupling the cars.

## DETAILS OF CONSTRUCTION

The driver's seat and the principal apparatus are placed at one end which is lengthened and built so low that the motorman can climb in and out conveniently. He is protected against dripping water and other falling objects by a roof and against drafts from the side

is placed in front of the locomotive to prevent accidents in case of collision. The seat itself forms a metal box for keeping tools. The other end is also lengthened sometimes to make room for a passenger's seat who is protected by a strong breast-work in case of collision.

The axles of the wheels are made of Siemens-Martin steel, the wheel centers being of cast-iron with steel tires which can be replaced when worn. The bearings consist of strong cast-steel cases with dust-tight covers. The bearing bushes, which can be readily exchanged, are made of gun metal and are rigidly fixed in the bearing supports. A grease box is

receive only half the voltage, and run at half speed. An automatic main-current switch and a main fuse prevent dangerous overloading of the motors. The lamps for the headlights are connected with a branch circuit which is also protected by fuses. A wall socket allows a hand lamp to be used, which facilitates the inspection of the interior of the locomotive.

The current is received in the majority of mining installations through an overhead contact line, the return current being sent through the rails. A three-phase plant is installed in most generating stations for mining service. It is

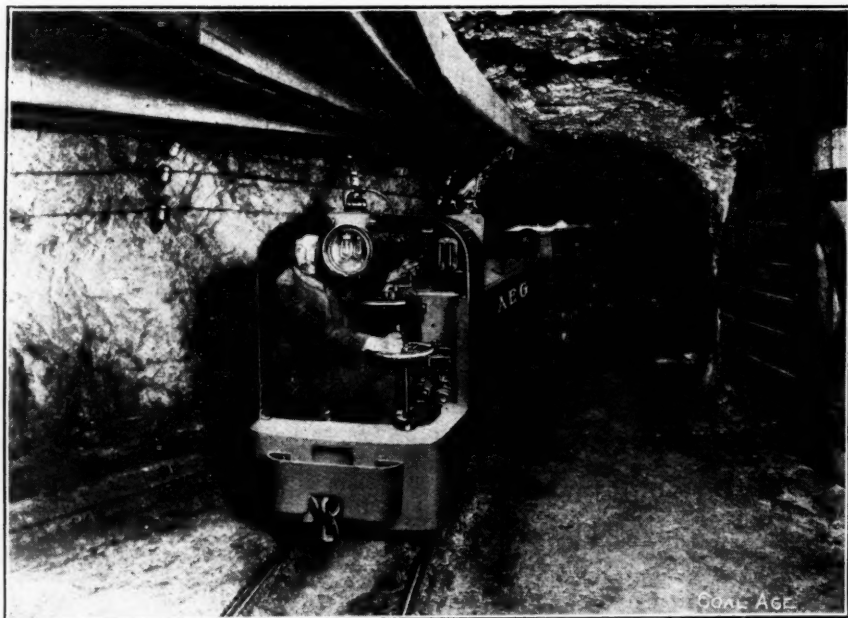


FIG. 3. SCENE IN A GERMAN MINE. TROLLEY WIRES PROTECTED BY PLANK TROUGH

generally converted underground to continuous current (see upper front page illustration) and is then led to the contact line at a tension of from 250 to 500 volts.

#### VARIOUS COLLECTORS FOR DIFFERENT NEEDS

When the overhead contact wire is laid at an approximately uniform height, small bows are used for the current collectors, as shown in Fig. 1, which reverse automatically according to the direction of travel. If the height varies considerably, or if it is necessary to protect the contact line at low points by a wooden covering (Fig. 3), trolley collectors are most suitable. This form must also be used for double-pole overhead lines.

For heavy currents such as are necessary for the 125- and 250-hp. locomotives employed in ore mines, for example, it is advisable to adopt a pantograph roller collector similar to those in Fig. 4. As may be seen, these heavy locomotives differ appreciably in other respects also from the form of construction previously described.

The lower part is constructed with a double frame of sheet metal 20 mm. (0.79 in.) thick. The locomotive can be controlled and braked from either end. As the locomotives also work in the open air, the driver's seat is completely inclosed. Removable covers facilitate access to the motors.

The four-axle locomotives consist of two 2-axle locomotives coupled together, each of which has a motorman's cab. In order to avoid the construction of two cabs, the more recent forms of heavy locomotives have been constructed with one central seat.

#### USE OF SINGLE-PHASE CURRENT

The construction of single-phase railways above ground and the successful results obtained with them have naturally led to the designing of like installations underground. The conditions for the latter, however, are much less favorable. The chief advantage, namely, that of using pressures from 5000 to 6000 volts, does not enter into question for underground service, where only pressures from 250 to a maximum of 500 volts are permissible.

Further, the voltage drop is so great on single-phase lines in consequence of the induction, that in most cases it is necessary to lay special feeder cables. In consequence of the need for a feeder cable and transformer stations along the track (see lower illustration on the front

page) the installation costs are usually as high as when a plant is installed with a converter station.

#### ACCUMULATORS SOMETIMES USED

In cases where, for any reason, it is not permissible to lay an overhead line, the employment of accumulators may be considered. Since special charging stations have been provided for renewing the batteries, instead of drawing the current from an overhead line, they are transported to the station which is fitted for that purpose and there reloaded for use. The equipment consists of the charging station and the locomotives.

As a locomotive can seldom make a sufficiently long pause to allow a fixed battery to be recharged, the batteries are made interchangeable, two or more batteries being usually provided for each locomotive (as shown in the Fig. 2).

While one of them is working in the locomotive, the other stands on the charging table and is recharged. From the charging switchboard, which is equipped with a switch, ammeter and a series resistance, the portable cable with its plug is led to the corresponding socket of the battery.

The series resistance reduces the current rush at the beginning of the charging period so that no regulation is necessary. The locomotive battery holders and charging tables are so arranged that the batteries can be conveniently rolled from one to the other. The remaining electrical and mechanical equipment of the accumulator locomotives corresponds in all essential details to those of locomotives receiving their power from overhead contact lines.

#### MOTORS WITHOUT MOTORMEN

In order to effect a saving in running expenses in cases where the haulage is

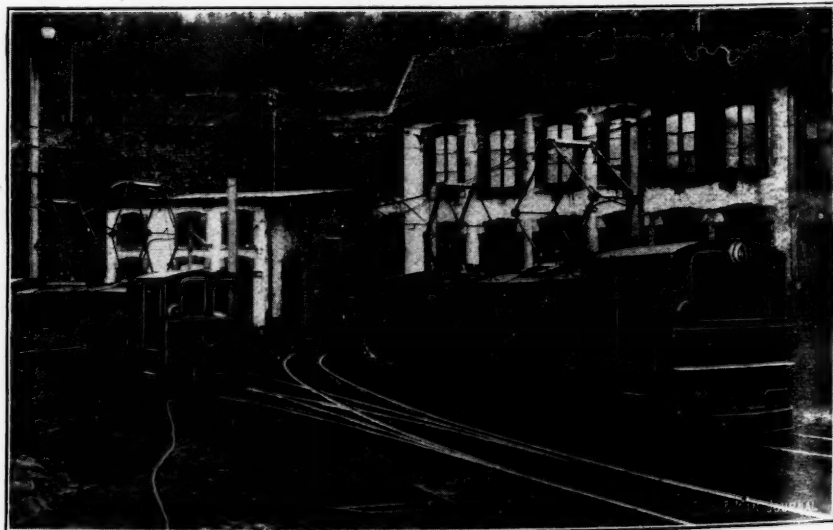


FIG. 4. PANTOGRAPH ROLLER COLLECTORS ARE USED IN HEAVY MOTOR SERVICE IN GERMANY

intermittent, the Actien Electricitäts Gesellschaft, a part or subsidiary of the General Electric Co., has recently constructed automatic accumulator locomotives, see Fig. 5. As the name implies, this type of locomotive travels without a driver. The controller is operated by

#### AUTOMATIC LOCOMOTIVES AND OTHER AUXILIARIES

The accumulator locomotives of all sizes can be constructed entirely explosion proof, and may, therefore, be used wherever danger of fire damp exists.

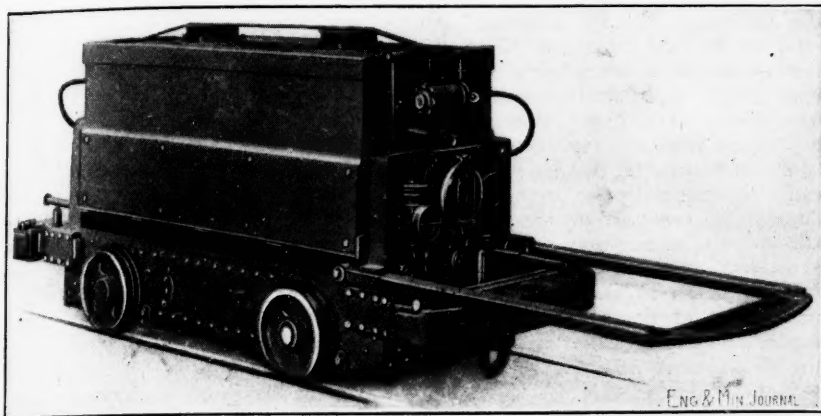


FIG. 5. THE "FEELER" FRAME AHEAD STOPS THIS MOTOR WHEN AN OBSTRUCTION IS ENCOUNTERED

means of a long wooden bow which projects about one meter (a yard) in front of the locomotive.

If the bow comes in contact with any obstruction on the track, it is pushed inwards, and thus switches the motor out, applying the brake at the same time. For traveling in the opposite direction the bow must be reversed. Various ingenious and simple devices for the setting of the points by the locomotive, and for the mutual protection of the trains, enable the locomotive to run by

Although the driverless locomotives are seldom suited for main haulage, they are of great importance for auxiliary service and for side-tracks, as they can travel over any track over which cars run.

In order to avoid having to lay overhead lines in such side tracks as are only used temporarily, the locomotives intended for this service are equipped with a cable reel. The flexible cable is hooked on behind one of the clamps of the overhead contact line before the locomotive leaves the main haulageway.

If the gradients of the side tracks are so steep that it is no longer economical for the locomotive to travel over them, the cable reel is replaced by a winding drum which is mounted on the locomotive and enables the driver to draw cars from a distance of about 100 m. or 328 feet.

#### WORKING COSTS LOW

The factor which finally decides whether electric haulage shall be introduced or not is the cost of operation. Great reliability in working with simplicity of operation, unsurpassed adaptability to any conditions, facility in the extension of existing plants, all these obvious advantages would not have led to such rapid introduction of electric-locomotive haulage in all branches of mining, if at the same time the working costs had not been reduced to such an extent that the expenditures on large plants could be written off in a few years solely from the economy effected as compared with previous costs.

If approximate values are required for general preliminary estimates, the following figures may be taken under ordinary conditions: Working costs for continuous current locomotives with overhead contact line, 0.9 to 1.2c. per ton-mile; for single-phase locomotives with overhead contact line, 0.9 to 1.2c. per ton-mile; for accumulator locomotives, 1.8 to 2.1c. per ton-mile.

The working costs are here based upon the output of the tramroad in ton-miles, i.e., the costs stated are those incurred in hauling one ton of material

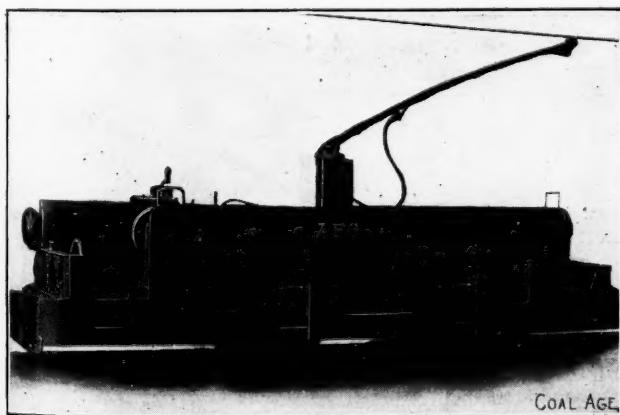


FIG. 6. A TROLLEY HARP IS USED ON THIS LOCOMOTIVE AS IN U. S. PRACTICE

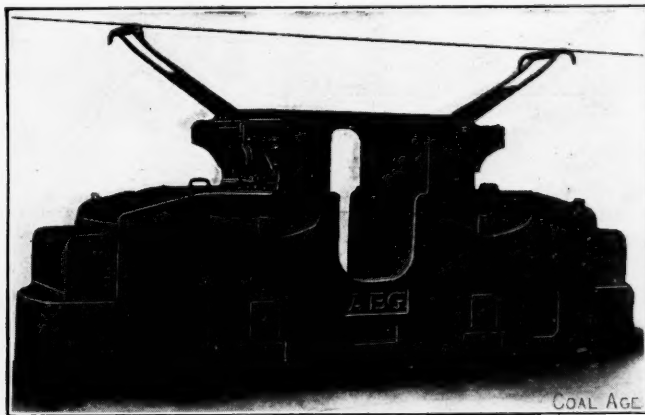


FIG. 7. A LOCOMOTIVE WITH CENTRAL CAB AND DOUBLE ROLLER COLLECTORS

itself, to a given place, after the current has been switched on, and thus the service is completely automatic. The locomotives at present constructed weigh 1.5 to 2.5 tons, and draw trains of 10 to 15 trucks in coal mines at a speed of 1 m. per second or about  $2\frac{1}{4}$  miles per hour.

The locomotive is now able to travel for a further distance of about 150 m. (492 ft.). A small electric motor which is coupled to the cable reel is constantly under current and holds the cable tight as it runs out, winding it up again at the necessary speed on the return journey.

over a track one mile in length. The above figures, which can be reduced under favorable conditions, enable any expert acquainted with his own working costs to ascertain by comparison whether he would be able to effect economy in his own installation by the introduction of electric haulage.



# How a Dust Explosion Sucks in Air

By John Verner \*

In my article published Oct. 12 on "Conditions Favoring Dust Explosions," I urged that there were always two movements of the air in an explosion, one away from the center of the disturbance and one toward it. This latter I termed the counter-current.

The existence of the counter-current or draft is not a matter of inference alone, but its presence during the progress of the explosion has been proved by the testimony of credible men who were caught in different explosions and who noticed what occurred and escaped to tell what they had observed.

## TESTIMONY OF THE FOREMAN AT LICK BRANCH MINE

Typical of the experience of others, but of special value because of the facts brought out and the competency of the witness, is the experience of Bowers, mine foreman of the Lick Branch mine, in which two violent dust explosions occurred. Bowers was underground about 400 ft. from one of the mine openings.

Mr. Verner gives evidences of the existence of a counter-current in a mine explosion. The testimony of Bowers is given that an insucking draft knocked him down with great violence before the explosive force struck him. Evidence is furnished at experimental galleries that the suction is least in evidence at the cannon or primary point of ignition. The draft opposing the explosion is shown by the movement of posts toward the explosion center. Dust without an air current will not readily ignite.

\*Chariton, Iowa.

in Fig. 2. Fig. 1 shows the Dupont testing gallery located at Repauno, New Jersey. It is similar in construction and arrangement to the gallery used by the

It is claimed that an explosion exerts a great suction power, and I have no doubt as to the existence of this action, but Fig. 2 shows that its demands are not supplied, or but imperfectly supplied, from the rear of the explosion. Were it otherwise the smoke would not appear through the top openings.

## WHERE IS THE CENTER OF BAROMETRIC DEPRESSION?

It is also said that a depressed wave or vacuum follows the explosive wave. I believe the location of the vacuum of greatest power in an explosion is not behind the explosive wave but in the center of the flame zone. But admitting that there is still an area of depression possible in the wake of the explosive wave and that it exists to some extent in the closing stage of the Repauno explosion, it is again evident that this area of depression is not filled by air entering through the openings on top.

Regarding the depressed wave or vacuum following the explosive wave and

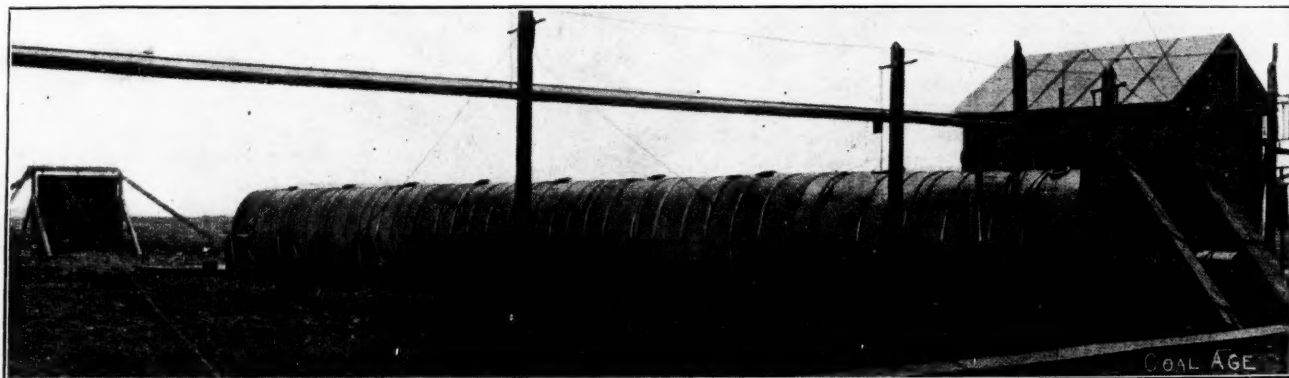


FIG. 1. THE REPAUNO TESTING GALLERY FOR TRYING OUT EXPLOSIVES

Without having any warning of danger, he was struck by a cold blast of air (the explosion occurred in January) coming from the outside with sufficient force to knock him down and injure him severely, two ribs being broken. The inrush of cold air was immediately followed by the outrushing explosion which passed over him.

After the explosion had passed, he managed to crawl to a place 200 ft. from the opening, where he was found in an unconscious condition. The man who was with Bowers when the cold blast struck them, was thrown in the ditch on the side of the entry and died there.

## THE EVIDENCE OF THE INSUCK OF AN EXPLOSION

The valuable testimony of Bowers and others regarding the counter-current or draft is further strengthened by the visible evidence of its existence presented

Bureau of Mines at the Pittsburgh experiment station.

Fig. 2 shows the Repauno gallery with an explosion still in action and furnishes most useful and instructive evidence regarding its behavior. It will be seen that on the left the smoke is still pouring from the mouth of the gallery in dense clouds, while at the same time smoke is issuing from every relief valve located along the top of the steel tube, though the issuance of smoke is almost invisible at those ports which are most remote from the firing end.

It will be further seen, and the fact and its meaning should have careful consideration, that the smoke is leaving the valve openings on what appears to be a graduated scale. Its volume and density is least at the first valve on the left, it is greatest at the last valve to the right, the one nearest the starting point of the explosion.

its effects, it is stated in the official description of results of the Bruceton explosion of Feb. 24, 1912, that "the track ballast in some places was lifted, being affected evidently by the depressed wave or vacuum which followed the explosion wave."

The exact location of the vacuum is not material, but it is essential that there be a clear understanding regarding its effects and a clear comprehension of the process by which the ballast was lifted. The vacuum was undoubtedly the initial cause of the destruction, but it was not the instrument by which that destruction was effected.

## DESTRUCTION WROUGHT BY COUNTER-CURRENT, NOT DIRECTLY BY VACUUM

Evidently the direct means by which the ballast was lifted was the force of the air or other gaseous matter rushing into the vacuum. That is plain enough,

but it is more difficult to determine whether the destructive blast came from the direction of the mine entrance or from the entry face.

#### MUD IS SUCKED AND THROWN IN THE OPPOSITE SENSE TO THE EXPLOSION

In the Pekay, Iowa, explosion, mentioned in bulletin 20 of the Bureau of Mines, the wet bottom clay on the main entry was lifted, thrown against the roof and coal and the marks of the splashes showed that they were caused by a force traveling in the opposite direction to the explosion.

Similar evidence was found in the Stuart mine explosion (West Virginia report, 1907) where a deposit of thick mud was blown against that surface of the standing posts facing away from the advance of the explosion. These and many similar cases, together with the evidence of Fig. 2, show that the demands of the vacuum were satisfied from the air ahead of the explosion and it is but natural that the area of depression within the flame zone should be supplied from the area of compression known to exist ahead of the flame.

The pressure of two forces moving in

have occupied prior to the explosion in the direction of the source of the latter, there is a marked absence of information regarding the cause.

It is said that after a dust explosion has reached its limits in one direction, a return rush sets in over its former course to fill the vacuum caused by the cooling of the gases and that this return rush may be strong enough to sweep along with it the posts and other loose bodies in its way.

But the vacuum mentioned cannot be powerful enough for this purpose, because the process of equalization of temperature is not delayed until after the expulsion is finished for the results of the experiments near the entry face show that such equalization begins with the commencement of the explosion. In Fig. 2, it can be seen vigorously at work at its end, and so it may be reasonably assumed that it is going on steadily during the whole action.

What is termed the return rush is at best only a rather slow retrograde air movement, entirely too feeble to produce destructive effects. I have talked with a number of men, who were caught in explosions, regarding their experiences

in opposition to the advance of the out-rushing current.

The existence of a counter-current explains why and how coal dust explodes, for without the presence of a strong dust-carrying draft, the dust could not be burned with explosive effects and rapid ignition and flame propagation would be impossible. As this fact was not sufficiently considered by the investigators of explosions, it is not surprising that the information regarding the process of dust ignition is rather indefinite.

#### DOES AN EXPLOSION CONSIST OF ONE OR MANY IMPULSES

Abel, in giving his view regarding the propagation of dust explosions, says: "A great commotion is set up by the rush of gas produced when an explosion originates and as it progresses. The motion of the air is such that particles of coal dust must be whirled up into it. It must continue to produce a mixture sufficiently intimate and sufficiently highly charged with inflammable particles to develop afresh the conditions which existed originally when the explosion first started and in that way the explosion may be considered a continuous one."



FIG. 2. THE GALLERY IN ACTION. SMOKE ESCAPING FROM MOUTH AND SAFETY VALVES

opposite directions at the same time is evident in Fig. 2, one force ejecting the smoke from the portal of the gallery, the other entering at the bottom of the portal and driving the smoke in the lower part of the gallery toward the face and out through the openings on top.

As to the presence of the latter force, further corroborative proof can be produced. When the Repauno gallery is examined after a dust explosion, there will be found accumulations of charred dust lodged against the sides of the bottom parts of the connecting flanges facing the entrance, swept there by the same force which drives the smoke to the face.

#### MOVEMENT OF POSTS TOWARD SOURCE OF EXPLOSION

It is a peculiar fact that, although frequent proof has been found that posts and other heavy material have been carried from the place they were known to

and especially regarding their knowledge of the presence of a return rush.

#### THE COUNTER-CURRENT PRECEDES AND SUCCEEDS THE EXPLOSIVE WAVE

One man had felt a strong rush of air, which swept him along for some distance, in the opposite direction to the course of the explosion. This was followed immediately by the appearance of the explosion itself. Another had witnessed the explosion die away in a shower of sparks quietly descending, like snow falling, as the miner expressed it.

Several from sheltered positions had seen the flame pass by, but none of these men had seen or felt a return rush after the explosion. Then, if there is no force of sufficient power to produce effects like the above mentioned after the expulsion, the force must have been present during its progress and must have been exerted

Abel throws no particular light on the manner of dust ignition, but the statement is of value because it presents an important feature which is closely connected with such ignition and which should be fully understood, namely, that a dust explosion consists really of a series of separate and distinct explosions, which follow each other in such intensely rapid succession, and with their individual effects so blended that the explosion appears to be a continuous one.

#### PROPAGATION BY SIMPLE COMBUSTION OR PROPULSION OF IGNITED DUST?

On p. 84, bulletin 20, of the Bureau of Mines, the following appears regarding dust ignition: "Whether or not concussion or compression of the air at the moment of attack by the flame is required for the ignition of the less sensitive dusts and for the propagation of flame is a question yet to be answered, but it is self-evi-

dent that the larger and heavier the particles are, the more difficult it is for the air waves in advance of an explosion to bring them into suspension where the flame can strike them.

"For continued propagation of flame, the dust particles must be so close together that the burning gas enveloping one dust particle will cause distillation of the volatile matter of the next particle and ignite it. In other words, at each successive moment of inflammation, there must be a certain density of dust for each character and size of dust."

Apparently two methods of propagation are here suggested, one in which ignition is effected by conductivity or radiation, requiring a certain dust density so that the burning gas enveloping one dust particle will cause distillation and ignition of the volatile matter of the next particle, the other by which propagation is effected by the flame striking the dust in front of it.

#### SIMPLE COMBUSTION

But it has been shown by tests and otherwise that sufficient inflammation of the dust to produce explosive effects can-

not be obtained by conductivity or radiation, and that the suggested process of propagation by the flame striking the dust ahead does not cause sufficiently voluminous ignition to extend the explosion with violent rapidity because before the flame can strike the dust ahead, there must be a power in existence somewhere to drive the flame forward.

This propelling force cannot affect the flame movement without influencing at the same time the dust and air movement ahead of it. It is evident that with the fuel and air moving at about the same velocity as the flames which follow, the dust combustion possible under such unfavorable conditions must be insufficient to extend the explosive wave.

#### DUST WITHOUT AN AIR CURRENT, INDUCED OR EXISTENT, WILL NOT IGNITE

Experimentally it has been found that the ignition of combustible dust placed in a heap and impinged upon by flame is difficult and slow. Sifting dust on a flame placed on the bottom of a box produced but negative results.

Hall made a number of experiments in

the Big Lady shaft, which is 630 ft. deep. From a cannon, placed near the bottom of a shaft, he fired a powder charge upward into dry, fine coal dust, which was thrown into the shaft at the top.

It seemed an ideal method of dust ignition and in some tests the dust was ignited with explosive effects, but many of the experiments, as Hall reports, failed to cause explosions or to ignite the dust. Others found that certain kinds of dust when thrown in suspension above a stationary flame and brought in contact with it, could not be thus ignited.

But these same dusts did ignite readily and without fail when they were blown into the flame by compressed air. The latter method of dust ignition has been found to be most effective and uniformly dependable, and is now profitably used in burning powdered coal.

The method of dust ignition in an explosion appears to be identical with the best method of burning dust as found by experiment. Similarly propagation is produced by the forceful injection of coal dust and air into the flame of the explosion by the counter-current or draft.

## Problems in the Washing of Coal

By E. C. Taylor\*

**Dealing with the construction and arrangement of washery buildings and machinery. Also a few practical hints on the selection of jigs and elevators. Coal-washing results obtained in laboratory tests are not sufficiently conclusive.**

\*Superintendent, Keystone Coal & Coke Co., New Alexandria, Penn.

The coal-washing problem is the same in many particulars, no matter what kind of coal is to be treated. Some varieties, due to large differences in specific gravity between the coal and the impurities, lend themselves readily to washing. Others, on account of only slight differences in the weights of these constituents, are difficult and sometimes impossible to handle economically.

The problems which are common to all washeries are those of crushing and screening the raw material, elevating and conveying it to the jigs, and, after it has passed through these, the recovery of the washed coal and refuse from the water, and the delivery of each first to bins, then, respectively, to the ovens and the culm heap.

#### MACHINERY MUST BE RELIABLE

This process interposes so many links in the chain of operations between the tippie and the ovens that one cannot afford to use other than the most reliable machinery, with each unit figured large enough in every case to carry its load without undue stress or wear. Even though one have ample storage capacity, which, by the way, is expensive to provide, especially for wet coal, an accident to any one of these links could easily cause a shutdown of several days, which would probably be beyond the storage capacity of the plant, and leave the ovens without coal.

Upon the continuous operation of the washery will depend not only that of the

coke ovens, but of the mine as well. For if the plant loads the larger portion of its coal on cars, the requisite number will be figured with the idea of the washer taking a certain proportion of the product.

This failing, the car supply will be short, and a shutdown of the mine necessarily result. Shutdowns are expensive and machinery notoriously breaks at inopportune moments.

Further, the management is often put to it to determine, in the case of accidents, the duration of suspension, whether for a few minutes only or for a few hours, and this is often hard to guess. Upon this estimate depends the question of whether or not to hold the men in their places and if the guess happens to be wrong the cost of production increases.

To go into detail the following steps are really necessary and common to all

washers built for handling a fairly large production, say 500 tons per day, or upwards.

To handle ungraded coal successfully it must be crushed, usually to such a size that the largest pieces will go through a 1½ in. ring, or even smaller. This is the simplest form of washing, as the grading process complicates the plant.

No crusher will reduce the ordinary run of mine coal to this size accurately at one operation, hence it is necessary to have two, one to break the larger lumps down to say 3 in. diameter, and the second for the final reduction.

That these crushers be not of excessive size, it is necessary to screen the run of mine coal so as to send only the lumps to the first crusher, hence also, before the product reaches the second it will be necessary to pass it over another screen, whose mesh is no larger than will allow the required size to go through, again crushing only that coal which goes over.

In order that the tippie may dump steadily and that the crushers may get a constant load and not be alternately overloaded and empty, it is necessary to introduce two small bins below the first screen, one for the lump, which should be fed to the crusher by means of an oscillating feeder, and one for the slack, which should flow in a steady stream onto some kind of conveyor, there being mingled with the product of the first breaker and conveyed to the second screen and crusher.



**GOOD MACHINERY SELDOM GIVES TROUBLE**

One seldom has trouble with any of this machinery if it be of good design and properly installed, except the second, or final crusher. This should be duplicated, and the two arranged so that either can be thrown into service quickly.

This completes the first series of operations, namely, the preparation of the raw coal for the jigs. The next step is to elevate this product to an oversize screen, which should always be put in to protect the washers from excessively large pieces, which the crusher is sure to allow to pass through it. This oversize material can be dealt with according to circumstances. Usually it consists of wide, flat pieces of slate and bone coal, which can be specially prepared for the plant boilers.

The main product now lands on a distributing conveyor and is carried to the bin over the washer proper. To be successful the jigs must have a uniform sup-

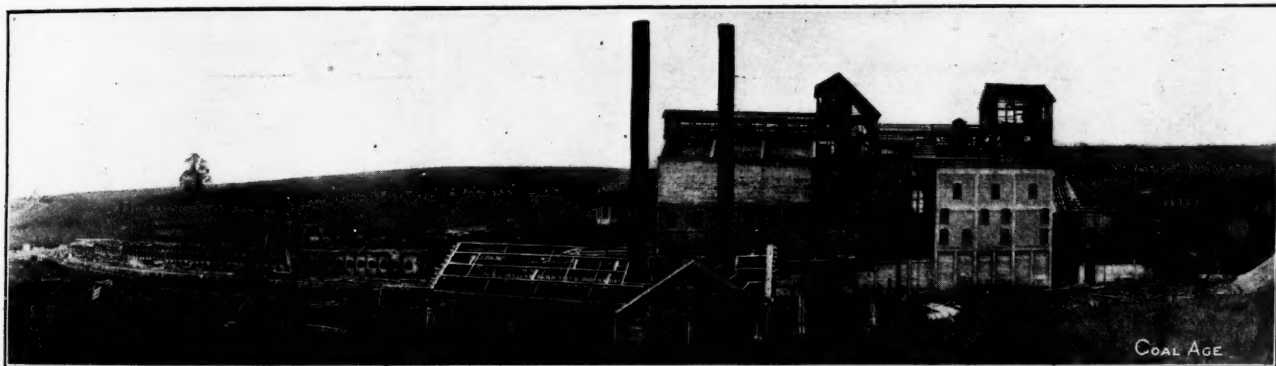
thence back to the circulating pump. The refuse should be rewashed and the bone coal separated from the absolutely useless material and saved for use in the plant boiler house, or sold as low-grade fuel. A good arrangement is to send this poor-quality coal to an elevator which works within a boot at one end of the large settling tank above mentioned. It is necessary to have a slow scraper in this tank to drag the fine settleings to the elevator, where both fines and bone are drawn up together, and thus mixed make a fair fuel.

This elevator must move exceedingly slow. In spite of its small burden it should be nearly as large as the one carrying the washed product. In this connection, in order to save multiplicity of repair parts it is economy to have the dry coal, the washed coal, and the low-grade fuel elevators all of the same size, as their calculated dimensions will be nearly identical.

compartments of such a capacity as to hold about two hours washing each; if the chargers draw from the bins in the same order each day in which they have been filled, it gives the coal from 20 to 22 hours to drain. This is important, as wet coal means cold ovens, consequently light charges, and perhaps poor coke.

**WATER REQUIRED**

Each jig, say, with a capacity of 12 to 15 tons per hour, will use about 300 gal. of water per minute. Multiply this by 10 (assuming that so many jigs are working), and we have a considerable quantity. This, of course, is not fresh water, but is merely that kept in circulation, the waste only being replaced. The handling of this large amount of water is best accomplished by a centrifugal pump. It can usually be arranged so that the lift against which the pump operates will not exceed 30 ft. Hence, though it must



HURON MINE, KEYSTONE COAL & COKE CO., NEW ALEXANDRIA, PENN.

ply, therefore the opening over each should be provided with a reliable feeder, otherwise the coal will choke at times and at others overload the machine.

There are so many good jigs upon the market that one may take his choice, and we will not dwell on this, the actual washing process.

The product leaves this portion of the apparatus through sluices and lands in the elevator boot. This must be deep and sufficiently large that the surface of the water will be little disturbed. The elevator must be slow moving, and consequently large and heavy for a given capacity. It should be cased down into the water for at least 8 ft. The water from this boot must be drawn off in a very thin sheet, the overflows being not over 1 in. deep. The entering water and coal should reach this boot with as low a velocity as possible. In fact, everything should be done to keep the water from being agitated in order that the fine coal be not wasted.

**SEPARATION OF WATER AND COAL**

The water from this boot should be then sluiced to a large settling tank and

The refuse elevator can be made smaller, but its speed should be rather low, as it also works out of the water, and as this water contains most of the impurities it is important that it be not too much agitated; however, the overflow from the refuse tank also goes into the big settling tank and the small impurities are there deposited and go out with the low-grade fuel.

**FINAL DISPOSITION OF PRODUCT**

To go back to the washed coal; it is now near the end of its journey. The elevator discharges onto a conveyor, which distributes the coal into the different compartments of the bins, from which the larries draw it for charging into the ovens. These bins should be made either of wood or reinforced concrete, never of steel, for the action of the sulphur in the water would soon destroy such a structure. In my opinion reinforced concrete is the only really economical material to use, but even this should be carefully waterproofed. The bins should be sufficiently large that the coal which is washed on one day need not be used until the day following. A convenient arrangement is to have them divided into

handle a large volume it will work against only a comparatively low head.

**AS TO MOTIVE POWER**

The motive power for all this machinery should consist either of two motors or two engines. Personally I prefer the latter. One engine to drive the dry-coal end, that is, the machinery that handles the product up to the time it enters the dry-coal bin, and the other to handle the wet-coal end, or the machinery that carries the product from the washers to the bins for wet coal, including, of course, the jigs, sludge recoveries and circulating pump.

A satisfactory arrangement is to place the main power house parallel to the washer building, with the washery engine and pump in the former with a shaft running through the latter. This gives a good opportunity for rope transmission and further, affords parallel drives to all of the machinery except the jigs and screens whose low-power requirements make right-angle drives unobjectionable. This is much preferable to the more common arrangement, whereby the main shaft runs lengthwise of the building, necessitating that the heavier

machinery be driven through bevel gears. Furthermore, by placing the engines and pump for the washer in the main power building they are not isolated, but under the care of the chief engineer of the plant, where they may receive proper attention at no extra expense.

The advantage of having the dry- and wet-coal ends of the washery machinery driven independently is this, that often the tippie will be dumping and the dry-coal end working, while the wet-coal end may remain idle, say for minor repairs or in the interest of economy.

#### MAKE THE BUILDINGS SUBSTANTIAL

It may readily be seen that all of this machinery and storage arrangement demands strong, substantial buildings. Re-

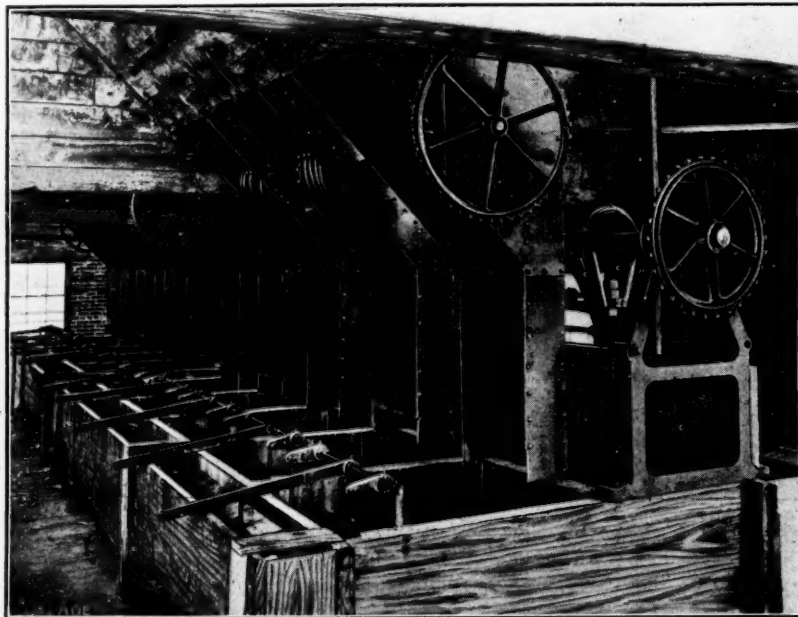
to have plenty of room all around the washers.

The determination on, or selection of, the best form of jig for any particular coal, is largely a matter of experiment. While it may be demonstrated in a laboratory that a certain coal may or may not be washed successfully, it cannot positively be determined beforehand what type of jig is best suited to any particular case. It is sometimes necessary, therefore, to change the type after the plant is in operation.

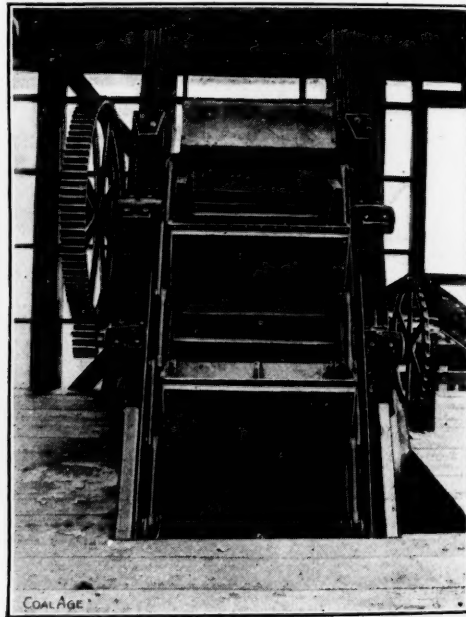
No matter what variety is installed, much depends upon the operator. Unintelligent manipulation will give poor results from the best jig ever devised by man, and none should be condemned until several capable people in succession

## Boiler Explosions

From an official report on boiler explosions at mines, the following excerpts are taken: (1) It is obviously desirable that only water containing no foreign matter should be used for feeding water-tube boilers, especially those in which the heating tubes are bent, making them difficult to clean or form an estimate of the amount of scale which may be deposited on their inner surfaces. (2) Cast iron is not altogether a suitable material for steam pipes, as the castings have frequently latent defects, which render them unreliable. In this instance (as explosion due to a faulty cast-iron steam pipe, owing to a steam hammer action, consequent to manipulate the stop valve



A BATTERY OF JIGS



HEAD OF WASHED-COAL ELEVATOR

inforced concrete lends itself admirably to all of this except the elevator towers, which should be of structural steel for the dry coal and yellow pine for the wet.

In the design and erection of this kind of a plant, it should always be remembered that some day every part of its machinery will have to be renewed, and in order to facilitate these repairs the question of accessibility must be carefully considered.

The type of jig or washing machine proper should be given very careful attention before being decided upon. Simple, conservative types should be adhered to, as there are many freaks put upon the market, which look good on paper, but generally do not work out.

In placing these machines, it is important that the operating platform be arranged for the greatest convenience of the attendant, and the light so controlled that he may readily see samples of the product as it passes from the jigs, without changing his position. It is well also

have failed to get satisfactory separation. Just what are reasonably good results should be decided upon before contracts are let for any part of the work.

The tests for this determination are very exhaustive and should establish beyond the shadow of a doubt just what theoretically perfect treatment will give. A careful operator, with a good jig, properly arranged, can very nearly approach theoretical separation and by the aid of adequate settling arrangements can sometimes do even better than what the laboratory has demonstrated to be perfect washing.

Breathing can usually be restored after an electric shock within an hour. Keep up artificial breathing for this length of time at least. After breathing starts begin to restore the circulation by rubbing the limbs briskly in the direction of the heart and under the covers with which the patient has been previously covered.

while the range contained water of condensation), it seems that the simple expedient of testing the pipe had not been resorted to, and there was no proper provision for the drainage of the steam.

The case of the Employers' Indemnity Co., of Philadelphia, against the Kelly Coal Co., of Bell County, Ky., has been reversed by the Kentucky Court of Appeals, the court holding that the indemnity company is not liable for \$1500 damages paid to a laborer named Carmichael. Carmichael was not a *bona fide* employee of the Kelly Coal Co., it was decided, but was employed by a contractor, who had agreed to mine coal in one section of the mine at a fixed price per ton. Though the Kelly Coal Co. paid the laborer, they had no control over him, according to the court. The coal company paid Carmichael \$2000 and endeavored to secure \$1500 from the indemnity concern. The lower court decided in favor of the Kelly Coal Co., but the decision was reversed.

# Current Coal Literature

The Best Thought Culled from Contemporary Technical Journals, Domestic and Foreign

## Alarming the Men When a Mine is on Fire

George S. Rice, in a preliminary study on "Mine Fires" (Technical Bulletin 24, Bureau of Mines), gives the following suggestions as to the means which can be installed for informing the men working in a mine of their danger in case of a mine fire or local explosion.

### CARE NEEDED IN INSTALLATION

"A telephone system below ground, with connections to the surface, is an economy in ordinary mine administration, keeps the management promptly informed of mine conditions, and is of vital importance. Too often the wiring is put in hastily and improperly, although it should be installed with even more care than a surface system.

"The wire should, if possible, be taken down a drill hole at some distance from the shafts so that the line will be in less danger of being cut off by fire or explosion. On account of these dangers, it is best to pass two or more lines into the mine through different openings.

### TELEPHONES HAVE PASSED WITHOUT INJURY THROUGH AN EXPLOSION

"Several makes of good mine telephones inclosed in iron boxes are now on the market. They are practically damp proof, and such instruments have passed without injury through the severe ordeal of a mine explosion. There should be at least one telephone in each fire district, which should be preferably placed at the point where the district fire-fighting apparatus is kept.

### FUSIBLE PLUGS, ELECTRIC BELLS AND WHISTLE ALARMS

"For the surface buildings, automatic fusible-plug alarms are well suited; whether they are adapted to use underground is perhaps a question, for the danger of their getting out of order is great.

"Electric-bell fire alarms, operated from one or more points, have been proposed as means to warn mine workers, so that if an alarm is given, they may run to the exits. The bells should be placed near enough to the working places to be readily heard. This system was tried in Illinois as an outcome of the Cherry disaster. It proved liable to get out of order, and its use was discontinued.

"Future improvements may make the use of gongs successful, but the tele-

phone will still be a necessity. Whistle alarms, operated by compressed air, have been suggested, and might be less liable to get out of order than electric gongs.

### ELECTRIC LIGHT SIGNALS

"An excellent fire-alarm system in one of the large copper mines is as follows: If fire is discovered, the hoisting-signal system is used. Nine bells are rung from the level where the fire has started. These bells notify the hoisting engineer that a fire is in a certain level. The switchboard controlling the lighting system is in the hoisting-engine room, and the engineer immediately pulls the light switch nine times, and thus flashes the fire signal to all those parts of the mine which are lighted by electricity. This notifies many men at one time, who in turn notify the miners in the stopes. Such an electric-light fire signal has the advantage of being always in repair, is not as likely to cause a panic as a bell, and, since it utilizes the lighting system, does not involve any additional expense."

## How to Avoid Gob Fires and Dust Explosions

At a meeting of the Manchester Geological and Mining Society, on Oct. 8, a paper was read by John Harger, of Liverpool University, on the question of gob fires. These fires have become so common that the very life of some mines is threatened by them.

### VEGETABLE FERMENTS AND OXIDATION CAUSE FIRES

Spontaneous combustion of coal heaps is in the first stage probably due to the action of enzymes. This is followed by the oxidation of the gas by air, brought about by the catalytic action of the coal itself, which continues until sufficient heat is generated to cause active combustion.

Whatever the mechanism of the first stage in the heating of coal, Dr. Harger says we know quite definitely that oxygen is taken up by coal, especially when it has just been mined. The rate increases with the fineness of the coal and is in proportion to the solid surface exposed; and the rate increases very rapidly with increase in temperature.

If the heat is confined and cannot get away, the temperature will soon develop and finally reach the stage at which the air actively combines with the hydrogen, giving water, a little carbon dioxide and

a paraffin smell. It is during damp, foggy weather that gob fires are most prevalent.

Another factor of more importance is the change in atmospheric pressure, which at such times often goes up and down several times in a day. Many of such changes are not big enough to be registered on the mercury column or in the barograph records, but they are measured by specially sensitive instruments.

### INERT GAS CURE

Regarding methods of dealing with gob fires, Dr. Harger suggests the use of inert gas, which can be supplied at very little cost. The system of suppression hitherto in use sometimes fails, in spite of every care and ends in a calamity like that at Cadeby.

This inert gas should be put into the wastes in the parts of the mine subject to gob fires, and kept going in sufficient quantity to counteract any variation of the atmospheric pressure and any short-circuiting of the air current across the wastes until the roof pressure comes on.

### WILL AIR REVERSAL SCRUB THE RIBS THOROUGHLY?

In the opinion of Dr. Harger, an excellent plan for preventing or lessening the number of fires in mines is to reverse the air current from time to time when the men are out of the pit. He says the periodical reversal of the air current will be a very simple means of removing most of the danger of dust explosions.

The dust in a mine is deposited in the millions of holes, ledges and crevices which are sheltered by projections from the prevailing current. It is this dust which is put into the air by the reversal of the ventilating current, which occurs immediately after an ignition of dust and gas.

It is this which makes a huge dust explosion possible. If the dust is not put into the air and removed by the reversal of the normal ventilating current, neither will it be dislodged by the gust of wind from an ignition of gas or a blown-out shot.

Dr. Harger explains that he does not advocate the reversal of the ventilating fan when a gob fire is burning, but hopes this reversal may prevent the starting of a gob fire.

Freight trains require coal about every 50 miles, while passenger trains usually run 100 miles or more without re-coaling.



# Concrete Timbering of Mine Shafts

By E. R. Jones\*

Monolithic concrete, plain and reinforced, has been used for a number of years for shaft collars and shaft lining at mines where conditions warranted such permanent construction, but not until 1909 was reinforced concrete tried in the form of separate members handled and placed in the same way as the ordinary timber sets for shaft lining. This first experiment was at shafts No. 3 and No. 4 of the copper mine of the Ahmeek Mining Co., at Ahmeek, Michigan.\*

## MIXTURES USED

Two distinct kinds of concrete were used in the beginning: (1) a good grade of gravel and natural sand from a local pit; and (2) the trap rock through which the shafts were being sunk, together with clean conglomerate sand from the Calumet & Hecla mill. Sets were made from these two classes of concrete and service has proved both to be equal to the requirements.

Pieces set aside for the purpose were allowed to season sufficiently that they might be given a fair competitive test. It was found on comparing the fractures that the sand and cement filling the spaces between the rounded pebbles broke away from these, while the fracture in the trap and conglomerate-sand combination continued through the larger elements of the mixture. The gravel mixture could doubtless have been improved considerably by careful washing, but the cost of preparation, compared with that of the trap-rock and conglomerate-sand prohibited its use in this particular case.

The concrete as finally used was composed of portland cement, conglomerate sand and trap rock tromeled over  $\frac{3}{4}$ -in. through  $1\frac{1}{2}$ -in. screens. The proportions used were 1:3:5 in wall plates, end plates and dividings, and 1:2:4 in the studdles (or struts). The reinforcement in wall and end plates consisted of three,  $\frac{3}{4}$ -in. monolith-steel bars with  $\frac{1}{4}$ -in. webs crimped onto them, together with two straight  $\frac{3}{4}$ -in. bars. The dividings were reinforced by four  $\frac{1}{2}$ -in. bars wound with  $\frac{1}{4}$ -in. steel wire, the whole presenting a column with square cross-section. Studdles were reinforced with two pieces of old  $1\frac{1}{4}$ -in. wire rope. Offsets were molded in all plates 5 in. from the inside face to accommodate lining slabs.

Also, holes were cored for the use of hanging bolts and bracket bolts. The wall plates, end plates and studdles have a cross-section of 80 sq.in.; dividings, 81 sq.in. The percentage of reinforcement

A practical example of the use of concrete instead of wood timbering. The weight of the former is about three times that of the latter, but it is interesting to note that the cost is only about two-thirds as much. Difficulties with the hoisting cages was experienced due to the inflexible rigidity of the concrete.

Note—Abstract of a paper read at the Michigan College of Mines Club, at Houghton, Mich.

\*Mohawk, Mich.

was approximately as follows: 5% in the wall, end plates and dividings, and 3% in the studdles.

## METHOD OF MOLDING

Reinforced-concrete slabs were molded for the shaft lining, the material used being fines of trap rock (under  $\frac{3}{4}$  in.),

used as shaft lining, no further comparison of the two is necessary.

In the molding of the concrete sets, 2-in. No. 1 white pine was used in the construction of the forms. These were soaked in Delaney's wood preservative and repainted with the same on the interior each time before setting up. This insured them against warping, and prolonged their lives indefinitely; it also secured a smooth and easy parting from the concrete when removed.

A concrete mixer of the drum type was employed in preparing the charge for the forms. The amount of water used in the mix was such that when the batch was piled, it settled rapidly without agitation. A drier mix was attempted by way of experiment, but owing to the amount of reinforcement employed, it was found impossible to ram this concrete into place.

The labor force required was six men, as follows: Two carpenters, setting up forms and keeping them in repair; one

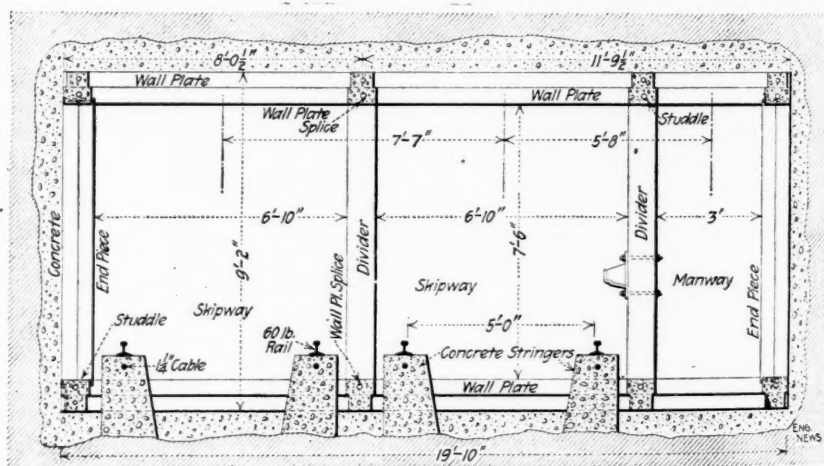


FIG. 1. MINE SHAFT (INCLINED) WITH CONCRETE SETS OF TIMBERING AND CONCRETE TRACK STRINGERS

and conglomerate sand, with Kahn expanded metal as reinforcement. The mixture used for slabs was 1:2:4. By way of experiment I selected a piece of No. 1 hemlock plank of the same length, width and thickness as a concrete slab which had seasoned for a year; these were supported at either end, and placed side by side, and then submitted to an equal pressure applied across the center of each.

Three failure cracks appeared in the concrete slab just previous to the breaking of the hemlock plank, although total collapse of the concrete slab did not occur until the pressure was considerably increased. While the method of the test employed was crude, it proved to the satisfaction of the writer that the concrete slab was much superior in strength. Considering the rapid decay of timber

man wheeling forms onto skidways ready for filling, returning used forms to shop and cleaning the forms; one man feeding the mixer from stock piles of rock, sand and cement; one man delivering mix to forms and shoveling material into place; and one mason ramming charge into final position. With this combination of men as many as four complete sets, consisting of 64 separate pieces, have been molded in one day of nine hours.

In ordinary weather, the sides of the forms were allowed to remain in position overnight, and then removed, while the bottoms were left in place another 24 hours. The bottoms were removed by turning the pieces on their sides, where they were left to harden one day longer before removal to the stock pile.

All through the process of removal, the

\*Monolithic concrete lining for mine shafts has been described in "Engineering News" as follows: Sept. 24, 1908; April 8, 1909; Oct. 26, 1911.—Ed.

sets were handled with the greatest care in order to preserve the appearance and to prevent cracking, which might not develop to the eye until weathered. All skidways used in making and storing were brought to a level to prevent warping and bending while the sets were green, so as to insure a perfect fit underground. This is particularly necessary since the concrete set (unlike timber) cannot be brought to place unless perfectly true.

Sets should not have been used under 60 days after removing forms, although (through the reduction of the stock piles) we have been forced to install pieces only 14 days old. But the greatest care was observed in handling and putting these in place underground. Concrete

remaining skip compartment. These two sections were connected when in place by two bolts passing through holes cored for the purpose and two straps of iron spanning the splice. Studdles were made for 4-ft., 5-ft. and 6-ft. sets, to accommodate the ground passed through. The weights of the different pieces comprising the set are as follows:

	Lb.
Long section of wall plate.....	1035
Short section of wall-plate.....	700
End plate.....	600
Dividers.....	645
39-in. studdles.....	268
Complete set, 16 pieces.....	8104

Taking the weight of No. 1 Western fir, which has been exposed to the weather in stock piles, as 33 lb. per cu.ft., the above concrete set weighs almost

rock thrown behind them, filling up what space still remains between the set and the wall of the shaft.

After the set is in place, it is extremely important that it be well protected from the blasts, for (unlike the timber set) the concrete will not stand the blast. For this purpose, I used flat timbers and steel plates chained to the under side of the plates and dividings, and even this precaution was at times inadequate. When the ground was breaking easily, the sets have been as near as 12 ft. to the miners; and when the ground was especially refractory, sets 40 ft. from the blast have had to be cut out on account of damage.

It is obvious that it is well to keep as far behind the mining as the ground will permit. In dangerous ground, which required timbering close up to the sinking, timber sets were used; but (had not time played an important part in the sinking) no ground was met in which concrete sets could not have been installed. With a gang of seven men, one complete set can be installed in a nine-hour shift. This permits a sinking rate of better than 100 ft. per month, which was accomplished at the Nos. 3 and 4 shafts.

#### COSTS AND MISCELLANEOUS DETAILS

The comparative cost of the concrete set and timber set, delivered at the shaft collar is striking. The concrete set was delivered for \$22.50, the timber set for \$37.50. These figures are based on the following prices:

Western fir, \$28.00.....	per M., f.o.b. car
Crushed rock, 35c.....	per yd., f.o.b. shaft
Conglomerate sand, 60c.....	per yd., f.o.b. shaft
Portland cement, \$1.15.....	per bbl., f.o.b. works
Reinforcement, \$12.00.....	per set, f.o.b. factory

The Ahmeek Mining Co. was the first to adopt concrete stringers for its inclined shafts,\* and the Mohawk Mining Co. soon followed. At the Ahmeek mine these stringers have been in continuous use since the beginning of operations and have required no repairs.

I am informed by S. R. Smith, Superintendent of the Mohawk Mine, that soon after the stringers were installed, the skip repairs increased several hundred per cent. The stringers being entirely rigid and the skip also of rigid construction, the axles of the skips were found to be crystallized and the rivets working loose.

This feature was overcome by molding 2-in. pine strips (treated with Delaney's wood preservative to prevent decay) into the stringers at intervals of 3 ft. These were allowed to project 1/2 in. above the face of the stringers, and the rails rested upon them. The pine strips have been in place four years, and none has been replaced to date, while the skip repairs have been reduced to normal.

At the Ahmeek Mine the repairs were not abnormally high, possibly because of

\*Engineering News, Jan. 25, 1906.

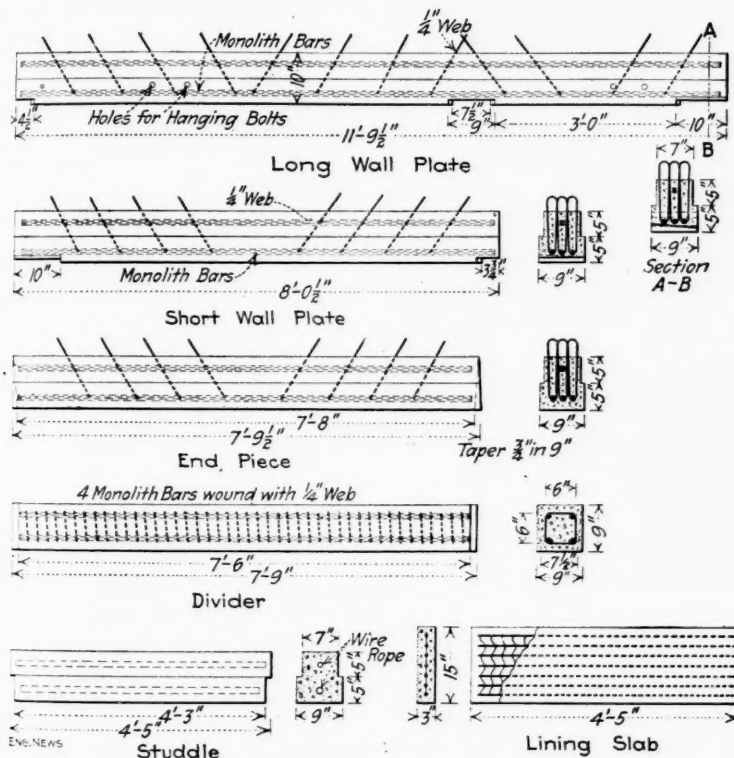


FIG. 2. REINFORCED-CONCRETE SETS OR TIMBERS FOR SHAFT LINING

sets one year old, which have been subjected to all manner of weather, can be abused somewhat and handled almost as carelessly as timber.

The shafts lined in this way are of the three-compartment type (with two skipways and one manway), dipping at an angle of 80°. The compartments are 7 ft. 6 in. high inside, with a width of 6 ft. 10 in. for the skipways and 3 ft. for the manways, with the end plates and dividings making the greatest span 7 ft. 6 in.

#### DIFFICULTIES IN ERECTING

Because of the great weight of the wall plates, it was found advisable to mold them in two sections, one section spanning the ladder way and one skipway, and the other section spanning the

three times that of a 12x12-in. timber set which the concrete set is intended to replace. Because of this additional weight of the concrete set, it was found necessary to increase the erecting gang from the usual 5 or 6 men on the timber sets to 7 men for the concrete sets. In a vertical shaft to which the concrete sets are especially adapted, the number of men per gang might be reduced.

The sets are hung or built as the ordinary timber sets, only requiring an additional rope and block to swing the pieces in place. After the sets are wedged to line, bottoms are put in between the plates and the surrounding shaft wall, and the set is then tied to the latter by means of concrete filling in the proportion of 1:3:5. The concrete slabs are then put in place, and loose



a differently constructed skip. But the same racking of the skip body occurred and the Ahmeek Co. has adopted the use of pine strips and expects to profit accordingly.

Concrete plats have been in use at both the Ahmeek and the Mohawk mines for some time. They differ from the timber plat in outward design only in the cross-section of the members; these are 9x12 in., reinforced with old rail and wire rope, and replace the 12x12-in. and 12x14-in. timbers formerly used. Holes are cored to accommodate gates for skip and dump doors and tram rails are imbedded in the concrete, making the use of spikes unnecessary. When turntables are used on the back of the plat, the rigidity furnished by the concrete insures the trammers against derailed cars resulting from a tilted table.

At the present time, the company is installing reinforced-concrete dividings to replace the practice of putting in 10-in. flat timber. In cross-section they are 9x12 in., and are reinforced by old rails. On the ladder road, they are placed 6 ft. centers and between the skip compartments they are put in as often as the hanging requires. Since the casing along the ladder road performs no other office than the protection of the men while on the ladder, or in case of a fall, plank is used for the purpose, and a 3-in. hemlock strip is molded into the dividings to facilitate the fastening of this casing.

#### NECESSITY OF CAREFUL MIXING

Quite often in the placing of concrete and reinforced concrete, both above and below ground, not enough attention is paid to the character of the men employed in charge of the mixing and actual distribution of the material. It is not enough that the work shall look finished and neat on the removal of the mold boards; any gang of men can accomplish this, when having only this end in view.

The placing of concrete where strength is desired, as well as weight and finish, requires the greatest care and judgment. Men should be selected who will see that the fines are uniformly distributed with the coarser material, for, unless the rock of the mixture is made to well overlap, segregation of coarse material and fines will occur. This will result in a weakness which often cannot be detected after the work is completed. The ideal method of placing the mix is by hand with shovel. But in shaft work, this method is slow and requires extra labor, where the work is situated some distance from the place of mixing.

Where chutes are used to convey the mix to its destination, the larger material arrives in advance of the fines, making an even distribution difficult and at times impossible. I have eliminated this feature by placing traps at regular intervals

in the conducting launders or chutes, for the purpose of retarding the larger particles, thus securing a more even mix at the end of the launders than at the beginning.

Since the cost of material for the making of concrete varies widely with the locality and the property, and there is also a discrepancy in the wage scales of the different mining companies, any detail of costs would not only prove tiresome but would be of little value, except where conditions were exactly similar to those described. Where cost is men-



FIG. 3. INTERIOR OF INCLINED SHAFT LINED WITH CONCRETE SETS

(The posts or dividers are between the two skipways, with the back-rail attached to iron brackets on the posts. At the bottom is one of the track rails on a concrete stringer. The plank wall at the back separates the skipway compartments from the man-way compartment).

tioned above, therefore, it is for the purpose of comparison in a special case with timber which the concrete has supplanted.

Concrete has long been used underground for bulkheads, forks, open gutters and casings for fire doors, and cannot be surpassed for these purposes. As applied to shafts, the material is comparatively new, but each succeeding year marks its advance, and in the end, timber will have been entirely superseded. For much of the underground construction, timber is still the rival of concrete; but owing to the increasing scarcity of timber suitable for mine use, it must make way for concrete and steel.

A feed wire for mine use should be of somewhat larger capacity than the trolley wire and should be run to the end of the haulage. The current should be fed in every 500 ft. which allows all the motors to get about the same amount of current and avoids the stalling of one motor while another is on a heavy grade.

## Coal Samples Analyzed

A few years ago a coal analysis was a complicated puzzle to most people. But recently it has become an economic necessity to scrutinize the coal bill as carefully as the food bill, and we have learned that a chemical analysis, when properly made from a sample properly taken, is the surest test of a coal's fuel value. This value is generally stated in terms of the British thermal unit (sometimes abbreviated to "B.t.u."), the quantity of heat necessary to raise the temperature of a pound of water 1° Fahrenheit.

Manufacturers and large commercial houses have now found it a matter of economy to determine the heating value of fuel purchased for power or heating, and the coal-testing laboratory is considered quite as important as the accounting room.

The United States government in making its contracts for coal requires a guaranty not only as to burning quality but also as to ash content. It goes even much farther than this and makes analyses of samples taken from each shipment to determine whether the standard set by the contract is being maintained.

From time to time during the last six years the United States has made analysis of a large number of samples of coal collected by geologists from various states and fields. Most of the samples were taken in anticipation of the publication of a geologic report on the field from which they were obtained. In view of the fact that the analyses are valuable to persons interested in the fields from which the samples were taken, the Geological Survey has published the data for more than 160 of these samples in Bulletin 471-J.

During the early stages of land classification all analytical work was done by the Geological Survey, but with the establishment of the Bureau of Mines the analyzing and testing of coals, lignites, and other mineral fuels passed to that bureau. A number of the coal analyses published in the bulletin were made under the direction of the Bureau of Mines.

In the tables the analyses are given in four forms, the first representing the sample as it comes from the mine; the second the coal after it has been dried at a temperature a little above normal; the third the theoretical condition of the coal after all the moisture has been eliminated; and the fourth the coal after all the moisture and ash have been theoretically removed. The last is supposed to represent the true coal substance, free from the most significant impurities.

A copy of the report may be obtained free on application to the Director of the United States Geological Survey at Washington, D. C.



## The Rocky Mountain Coal Institute

No movement designed to better mining conditions in our coal states could hope to meet with better support, or greater encouragement from those directly interested, than the plan to form a coal-mining institute in Colorado, Wyoming, Utah and New Mexico. Coal men in other parts of our country have written, expressing their interest in this kind of work, and it is quite probable that before a year has passed, mining men in every part of America, not already served, will have perfected a similar organization.

In order to make plain the interest and personal coöperation that prominent Western operators have accorded the present movement to launch a worthwhile coal institute, extracts from a few letters are here given:

Frank Manley, vice-president of the Union Pacific Coal Co., says: "It would give me great pleasure to do anything in my power to help organize a western coal-mining institute."

W. J. Murray, vice-president of the Victor-American Fuel Co., writes: "I have advocated this very thing for years. Will not hesitate to do anything I can to forward this movement."

T. H. O'Brien, general manager, Stag Canon Fuel Co., remarks: "Will do anything that will bring about the results desired. Have long considered that we, in the West, were rather slow in not having some kind of an organization that would bring together the mining men from the different sections, where topics of general interest could be discussed and opinions exchanged. We needed some such medium as your publication to 'start the ball a-rolling.'"

H. G. Williams, general manager of the Utah Fuel Co., says: "Am highly in accord with the action proposed, and will be glad to lend my services in furtherance thereof."

Allen French, general superintendent of the St. Louis Rocky Mountain & Pacific Co., writes: "Will certainly attend the meeting and coöperate in every possible way to make same a success."

J. S. Miller, general manager, Southern Superior Fuel Co., says: "There could not be any organization started here in the West that would be more beneficial to the mining class than something of this kind."

D. W. Brown, vice-president Rocky Mountain Fuel Co., writes: "Will do anything I can to assist in the matter of the Institute."

F. N. Cameron, general manager, Castle Valley Coal Co., Consolidated Fuel Co. and Black Hawk Coal Co., says: "I will do anything I can, at any time, to assist the Institute in every way."

T. J. Lewis, superintendent of the Weber Coal Co., in Utah, says: "Will take pleasure in doing anything within my power to further the organization of a coal-mining institute in the Rocky Mountain states."

J. E. Pettit, state mine inspector, of Utah, and James Dalrymple, chief inspector of Colorado, are both enthusiastic about the proposed new organization, and have volunteered their services in carrying the plan to a successful conclusion.

Dozens of letters have been received from other Western coal men who are interested in this work, and no one can doubt that when mine operators of the prominence and ability clearly indicated by the list of names above mentioned, father a worthy movement of this kind, success is assured.

Among those who have written us, asking that their names be included as charter members of the new institute, are the following:

### COLORADO

D. A. Cannon, Pres., Denver  
E. J. Ulrich, Pres., Colo. Springs  
J. E. McLaughlin, Pres., Trinidad  
H. F. Nash, V. Pres., Denver  
C. H. Berryman, Sec., Denver  
I. Mellinger, Mgr., Morrison  
F. R. Field, Mgr., Denver  
B. J. Matteson, Asst. Mgr., Pueblo  
J. McDowell, Sec., Oak View  
Robt. Nichol, G. Supt., Forbes  
W. G. Ferguson, G. Supt., Denver  
R. M. Perry, G. Supt., Oak Creek  
J. Cameron, Supt., Hastings  
Jas. O'Neil, Supt., Higgins  
Geo. White, Supt., Louisville  
J. H. Dunmore, Supt., Rugby  
J. F. Robbins, Supt., Denver  
I. D. Zook, Supt., Majestic  
C. H. Peet, Supt., Walsenburg  
D. M. Sultz, Supt., Lafayette  
W. F. Murray, Supt., Delagua  
H. B. McFadden, Supt., Tioga  
Jno. Rees, Supt., So. Canon  
Chas. O'Neil, Supt., Tobasco  
T. P. Davis, Supt., Farr  
B. W. Snodgrass, M. S., Delagua  
J. S. Thompson, Supt., Trinidad  
B. Shubart, Denver  
W. B. House, Denver  
W. B. Lloyd, Trinidad  
Samuel Dean, Delagua  
G. R. Delamater, Denver  
F. W. Whiteside, C. Engr., Denver  
R. Shumway, C. Engr., Denver  
F. L. Miller, Div. Engr., Trinidad  
C. C. White, M. E., Perins  
H. H. Sanderson, M. E., Trinidad  
F. L. Miller, Div. Engr., Trinidad  
M. S. Ketshum, Prof. C. E., Boulder  
C. A. Allen, Asst. Prof. Min., Golden  
C. W. Moore, Mine Clerk, Superior  
D. J. Griffith, C. Insp., Trinidad  
Henry King, Insp., Trinidad  
T. J. Knill, Surveyor, Lafayette  
Lee Manley, M. Foreman, Coal Creek  
Wm. West, M. Foreman, Delagua  
T. W. Tweeddale, M. Foreman, Tercio  
Daniel Rees, Miner, Bowen  
Geo. Conder, Engr., Walsenburg  
E. V. Jansen, Shot Firer, Cokedale  
J. C. Lawrence, Machinist, Starkville  
H. H. Bubb, Mach. Runner, Cokedale  
W. J. Beere, Pit Boss, Maitland  
H. Breen, Sugarite  
Henry Bock, Leyden

### UTAH

W. R. Elliott, Mgr., Salt Lake City  
H. C. Marchant, Sales Mgr., Ogden  
J. B. Forrester, Geologist, Salt Lake City  
H. E. Lewis, Supt. Mines, Hiawatha  
E. Ostlund, Supt. Mines, Utah Mine  
A. L. Bailey, Supt., Sunnyside  
R. R. Kirkpatrick, Supt., Sunnyside  
W. W. Jones, M. E., Hiawatha  
J. P. Russell, Asst. Engr., Salt Lake City  
W. N. Wetzel, Castle Gate  
Otto Herres, Asst. Engr., Castle Gate

### NEW MEXICO

Walter Kerr, Supt., Koehler  
J. Smith, Supt., Dawson  
W. W. Risdon, Supt., Madrid  
M. G. Smigelow, Supt., Gardiner  
J. B. Morrow, Supt., Dawson  
John Hart, Carthage  
Edmund Thomas, M. Insp., Dawson  
T. C. Harvey, M. Insp. Koehler  
F. Stafford, Dawson  
S. Froman, Dawson  
I. W. Morris, Koehler

### WYOMING

P. J. Quealy, V. P. & Mgr., Kemmerer  
D. Harrington, Gen. Mgr., Crosby  
W. F. Harris, Supt., Kemmerer  
J. A. Martin, Contractor, Superior  
W. G. Knox, M. E., Frontier  
E. F. Woodson, M. E., Rock Springs  
J. M. Sampson, Foreman, Superior  
W. Irving, Asst. Foreman, Hudson  
D. Prentice, Diamondville

In our issue of Oct. 12, page 500, we published the names of the organization committee, of which E. H. Weitzel, general manager of coal mines, Colorado Fuel & Iron Co., Denver, Colo., is chairman. Everyone who is interested and who has not already communicated their name to us is advised to write Mr. Weitzel immediately, giving his name and address, and asking to be notified of the time and place of the first meeting.

[With the foregoing bulletin, COAL AGE retires from a leading part in the new movement, although we remain ready at any and all times to lend our help to this laudable work in the same way that we have given time and encouragement to similar institutes here in the East. However, in the future, we will take our orders from those who have been selected to direct the new "Rocky Mountain Coal Institute." "Go to it" and may success attend your every effort.—EDITOR.]

## Rescue Work in England

Rescue work in English mines is compulsory. Mines employing less than 250 men must maintain one rescue corps. If more than 250 men and less than 500 are employed two corps must be maintained. If more than 500 but less than 800 men are in the workings three corps are mandatory, while the employment of more than 800 men calls for four rescue corps. Each corps is provided with two sets of breathing apparatus, two small mice or birds for carbon-monoxide tests, two electric hand lamps and one safety lamp for each member of the corps. All central rescue stations must be equipped with at least 15 complete sets of rescue apparatus with sufficient oxygen to last for two days, 20 electric hand lamps, first-aid-to-the-injured kits, fresh drinking water, four oxygen pulmotors and birds and mice. Each mine must be provided with a motor car for quick action in case of accident.

## Illinois Civil Service Examinations

The following persons qualified, in the examination for manager of mine-rescue stations, held at Springfield, by the State Civil Service Commission, W. R. Robinson, secretary, Oct. 3 and 4, 1912:

Oscar Cartlidge, 307 W. College St., Marion.  
Evan D. John, Carbondale.  
John Dunlop, 414 Chambers Ave., Peoria.

Following are the names of those who passed the civil-service examinations held by the commission, at Springfield, Sept. 10, 1912:

Chas. Krallman, Glen Carbon.  
Thomas C. Wright, Belleville, 120 N. Washington St.  
Robert Reavley, Riverton.

# Who's Who—in Coal Mining

Devoted to Brief Sketches of Prominent Men, Their Work and Ideas

The unceasing struggle for the spotlight is a feature of our twentieth-century life, and this, while it does much to bring out the best in men, serves also to make them superficial and unscrupulous in their regard for the rights of others.

There are, however, a few adherents of a far older and less material ideal. Such visions as they pursue seem always to confront extinguishment among men, but never do they wholly die though they are alien to our present-day materialism. These men seem to glory in self-effacement. The only effort they make is to bring into the brilliant light of human approval that organization to which their lives are devoted.

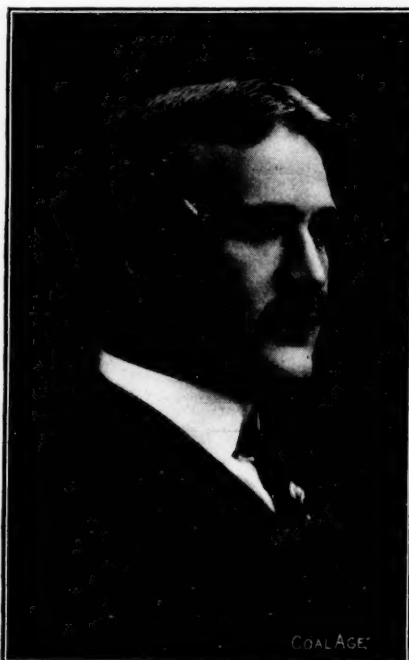
Their ambition takes an impersonal turn. As some men labor to advance a science, other men strive to promote a business, and so set are they in that single ambition, that they rather resent as belittling an attempt to disclose the *personae propriae* by which the work is effected.

Among such men is F. M. Chase, now vice-president and general manager of the Lehigh Valley Coal Co. He is even now not a whit more completely an integral part of that corporation than when he was an errand boy. Since entering the office of the "Valley," all his labors, aspirations, thoughts and longings have been to promote the projects of that concern and its material interests, and in developing its future he has always seen his life work.

For some men the opportunity to labor is in itself a sufficient incentive. The only reward for work which they seek is to enjoy the satisfaction of having accomplished their purposes. They have a mania for doing something well—a passion for efficiency in action.

The praise which accompanies their achievements, the mere emoluments which they draw do not in any large measure appeal to them. The plaudits which greet success are not valued as personal tributes, but as recognition of that army of endeavor over which, it seems to them, a blind chance has given them direction.

F. M. Chase was born at Broad Top in Huntingdon County, Penn. in 1865. He wandered northeast into Wilkes-Barre, and when only 14 years old, entered the services of the Lehigh Valley Coal Co. as office boy. The work of the average roustabout in an office is one of those "blind alleys" of which so much has been made by child-labor experts.



F. M. CHASE

Carrying messages, filling ink-pots, and distributing supplies offer no considerable opportunity of "learning the business." In fact, we hear too much of occupations which lead nowhere. It is only the boys who in their spare moments prepare themselves for advancement who work their way up. What route, direct or indirect, did Mr. Chase find leading inevitably from office boy to mine manager? Only study, observation, and again study, could lead to success.

It is true that some aver that F. M. Chase owes much of his rise partly to his good tutors, and we doubt if we could shake him in his determination to give them all the credit. But the opportunity to succeed is never given to men unless adequate knowledge and fitness are shown.

The friendly training and advice of older men is never broadcast on any but suitable soil, and F. M. Chase, anxious to work and absorbed in the success of the operations on which his ambitions were centered, did not fail to profit and develop from every possible source. Always write opportunities and profit together, but remember that the opportunities come from the ability to profit, and that profit most infrequently comes from opportunities to succeed.

Fred Mercur was general superintendent when F. M. Chase entered the service

of the Lehigh Valley Coal Co. Under him, after seven brief years, Chase became chief clerk—an office which suggests more in the anthracite regions, than elsewhere because, to tell the truth, the coal companies are prone to be niggardly in conferring titles.

The late W. A. Lathrop succeeded Mr. Mercur, and F. M. Chase acted under him from 1888 to 1901 as chief clerk and chief accountant. In the latter year, S. D. Warriner succeeded Mr. Lathrop, and Mr. Chase continued with him till his resignation in June, 1912, in the various offices of chief accountant, assistant to the general manager, assistant general manager and general superintendent.

The latter office was created specially for him, but when Mr. Warriner resigned to become general manager of the Lehigh Coal & Navigation Co., Mr. Chase succeeded him as vice-president and general manager, July 1, 1912.

This position is an important one in the anthracite region. The incumbent has control of 34 collieries in Luzerne, Lackawanna, Carbon, Schuylkill, Columbia and Northumberland counties. The methods of operation vary considerably and demand important differences in technique. In 1910 the Lehigh Valley Coal Co. and Coxe Bros. Co., over the operations of which Mr. Chase presides, produced 7,436,690 tons and 1,371,570 tons, respectively. In the aggregate they produced 10½ per cent. of the whole anthracite output, and only two companies had larger productions.

We doubt, however, if all the large authority vested in Mr. Chase is to him any more than a cachet, permitting him to labor on a larger scale than ever before, giving him a broader opportunity to be of service to the corporation with which his life is identified, and permitting him to be the means by which its growing tonnage may creep up a step or two nearer the larger outputs of the two leading rivals in the field.

Where other men use bull-dog force and aggressiveness, Mr. Chase uses diligence and persistence to effect his purposes. His is the smile of general welcome, and the men who work under his direction are his collaborators in a work which he has made them feel is more than a mere vocation. It is for them, as for him, an ambition for the consummation of which he lives and works. It is this intensity of interest in an impersonal aim which develops "team-work" and loyalty.



Issued Weekly by the  
**Hill Publishing Company**

JOHN A. HILL, Pres. ROBT MCKEAN, Sec'y.  
505 Pearl Street, New York.

Monadnock Bldg., Chicago.  
6 Bouverie Street, London, E. C.  
Unter den Linden 31—Berlin, N. W. 7.

FLOYD W. PARSONS, Editor.

Correspondence suitable for the columns of COAL AGE solicited and paid for. Name and address of correspondents must be given—not necessarily for publication.

Subscription price \$3 per year in advance for 52 numbers to any post office in the United States or possessions, and Mexico. \$4 to Canada. \$5 to any other foreign country.

Subscribers in Great Britain, Europe and the British Colonies in the Eastern Hemisphere may send their subscriptions to the London office. Price 21 shillings.

Notice to discontinue should be written to the New York office in every instance.

Advertising copy should reach New York office by Thursday of week prior to date of issue.

Entered as second-class matter, October 14, 1911, at the post office at New York, New York, under the act of March 3, 1879.

Cable Address, "Coage," N. Y.

#### CIRCULATION STATEMENT

Of this issue of Coal Age, we will print 9000 copies. No copies will be sent free regularly. There will be no back numbers. The figures shown here each week represent live, net circulation.

*This journal is interested solely in matters relating to the fuel industries, and is designed to be a medium for the free interchange of ideas, the detailed description of coal-mining practice, and the expression of independent thought calculated to benefit both operator and miner.*

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# COAL AGE

## The Car Situation

Railroad presidents, and transportation officials in every branch, are predicting one of the most tremendous car shortages during the coming winter, that this country has ever experienced. They have been drilling the fact into the shipping public for some time by means of bulletins and manifestoes urging all shippers and consignees to release equipment at the earliest possible moment. The matter has been given considerable publicity in the press of the country, and conservative authorities on transportation questions are agreed that the situation during the winter will assume serious proportions.

The coal industry does not entertain any particularly friendly or sympathetic feeling toward the railroads, for many reasons. The latter have frequently called forth the most bitter denunciations from the operators due to the arrogant position they often assume. Every coal man of any experience has probably at one time been the recipient of a communication to the effect that cars can only be supplied for loading railroad coal for which such and such a figure will be paid. Additional resentment has been occasioned by the lack of equipment in times of active demand when the operator is often in a position to obtain heavy premiums for his product.

As regards the impending shortage, and viewing the situation from an entirely neutral standpoint, there are certainly extenuating circumstances in favor of the roads. The term railroad, as commonly applied has a broad meaning. Thus the local operator may draw his picture of the transportation line from an unreasonable and hard-headed local superintendent, while to others, the system and its president are synonymous, but probably only a few people associate the policy of the road with its board of directors in Wall Street.

If the truth were known, and it was possible to compute the water carried by modern railroad securities, upon which

the operating departments are compelled to show earnings, we believe it would not be difficult to locate the source of the trouble. There is undeniably a brand of cold-blooded avariciousness emanating from Wall Street, that would shame the most irascible mine superintendent in the country.

A glance at the railroad's expenses and earnings presents some interesting points on this feature. Thus, for the fiscal year, recently closed, the gross earnings of the railroads increased nearly 55 million dollars as compared with the year previous, while the net showed a decrease of fifty thousand dollars. Out of the latter amount over 12 million dollars increase in taxes had to be paid.

And, further, railroad securities are falling seriously behind in the matter of first claim upon public favor. A comparison in this respect is reflected in the September financing, the issues for the month being largely above those for the same month last year; but of these the railroads had only one and one-half million as compared with nearly 16 million for industrials. For the year, the railroads have issued over 23 million dollars less in securities than last year, while, during the same periods, industrials have increased their issues by over 360 million. Railroad bond issues have always been a favorite form of investment but these decreased nearly 100 million during the year. At one time it was impossible to market industrial securities in competition with the railroad, but that condition no longer prevails.

The students of transportation problems advise us that the country requires eight billion dollars worth of railroad improvements, but, in the face of prevailing conditions in financing railroad securities, there appears small likelihood of any such amount being obtained. And if it is not obtainable, the only alternative is for the country to shrink itself within the limits of the present capacity.

The year of 1907 saw the heaviest freight movement the country has ever experienced, and it is interesting to com-



pare the relative capacity of the roads at that time with the present. Five years ago the 161 railroads which are members of the American Railway Association, and which operate 230,753 miles of track, had 5.4 per cent. less freight cars than today. The number of cars per mile of line has increased from 9.2 to 9.7 or 0.5; the average tonnage capacity of each car has increased 7.04 per cent., and the average tons carried per car, 7.3 per cent. This nets a total increase in the ton-mile handled per day, of from 331 in 1907 to 366 in 1912, or 10.6 per cent.

Statisticians point out the fact that the average delay on empty cars placed for loading and *vice versa* is 48 hours, and that a reduction in this time by one-half, would double the car supply. If such is the case, there is justification in the railroads' aggressive campaign to accelerate the prompt release of equipment. However, when it is remembered that the revenue obtained from a car under demurrage is only \$2 per day, as against \$35 per day when in service, the strenuous efforts of the roads in this direction may be ascribed to other reasons.

In view of the heavier motive power, larger and more plentiful cars, increased track and terminal facilities, it is estimated that the transportation capacity of the country today is 25 per cent. greater than in 1907, the previous record year. It seems hardly probable that traffic will show any greater increase than this, and if shippers can be induced to effect a 20 per cent. reduction in car delays, the shortage will certainly be less pronounced than in 1907.

The advent of cold weather about the middle of November usually marks the beginning of an acute situation in transportation. Navigation in the Northwest begins to ease off or close down entirely about this time, while the efficiency of locomotives is reduced about 20 per cent., and the combination of these two unavoidable conditions marks the beginning of the trouble. With the heavy crop movement still under way, the peak of the load is reached at about this time and the roads immediately get behind and continue so until in the early spring.

The most recent report of the American Railway Association shows that the decrease in the surplus of idle cars for the two weeks ending Oct. 10 amounted to only four thousand. During October,

1907, the situation became rapidly acute and the congestion so severe that traffic was almost at a standstill.

This fact tends to substantiate the prediction of the association that the car supply will be much easier than during the previous severe shortage.

### What Is a Labor Union?

We have no quarrel with a certain degree and kind of collective bargaining. Both labor and capital tend to make contracts as units and that tendency is on the increase. It has been said, that the operators in the bituminous field are not allowed to form a trust, but nevertheless are confronted with a labor organization which holds, in effect, a monopoly of labor.

As a matter of fact, it is true that though no trusts have been recognized for the control of the output or of the price of the mine product, no objections have been taken to loose amalgamations for controlling labor, and both capitalists and laboring men have formed such organizations for their mutual protection.

It is recognized that the capitalist needs the support of a common agreement, for each unit producer must meet the competition of every other unit and cannot do so if the rates of pay are not uniform or at least if they do not bear a continuous relative value to former rates on which the business was established.

A trade union is either a labor merchant or a labor trust. Let us suppose we have an open shop, so that the first definition applies. The labor merchant should pursue the same policy as any other dealer, the seller of coal, lumber, flour or any commodity. He should seek like him, to deliver a good article or he will be driven ignominiously from the field.

We do not suppose that the miners' union will drive out all the incompetent men from its ranks. Its solidarity depends too much on its acceptance of all who offer to join, in fact, it is anxious to compel or induce the unwilling to wear the badge.

But although we do not expect that, at present, the incompetents will be driven out, we do hope that the union will for its own good, declare boldly against such poor workmanship as arises from careless indifference or deliberate intention.

If it is going to stand for poor work-

men, well and good, but let it demand that every man fulfill his contract, drive his heading just as wide, just as high, just as straight as his contract requires. Let it insist that pack wallings be tight and that room necks be as long and as narrow as the schedule provides.

It should demand that the rooms be driven only as wide as the contract by implication or by specification requires. Let it see that straight work replaces the present careless meanderings. Where men lay their own track the union should insist that it be laid straight and true.

In fact, the honor of the union should be back of its label just as the honor of the Goldsmith's Guild is back of the "lion's head erased" on English silver. Indeed such ancient devices as this were the union labels of a past age and represented a class consciousness which animated every guild.

For it was the frequent custom of the officers of the various labor organizations of medieval Europe to visit every artificer to see if his work were true, his silver fine, his stitches firm or his iron unburned.

If the union would live, let it sell honest goods. Let it proclaim itself a sagacious merchant, who sells a good article at a predetermined price. It will then be regarded with favor and approval rather than with distrust. The union will then stand for good work and reputation. In its dealings with capital, both employers and men will be negotiating on honor.

But, if the union is a trust, it must, at least, be a "good trust." Even of the Standard Oil Co. it is well said that it is giving the public good service. Its products are pure, its standards of quality are fixed, and it is aggressive in development, and all this we must admit to be true even if we are of opinion that the profits made are too high.

The public is sometimes no little in doubt whether if it were dissolved in fact as well as in law, if its monopoly were replaced by a cut-throat competition, conditions would not be made worse rather than better.

If mine labor would form a successful trust, that monopoly must be, or at least appear to be, beneficent, or an outraged people will demand its suppression and the profits to capital to be gained by its destruction will make the attempt well worth while.

# Discussion by Readers

Comment, Criticism and Debate upon Previous Articles, and Letters from Practical Men

## Should Mine Fans Be Built Reversible?

*Letter No. 3*—Quoting from the Foreword, Oct. 12, 1912: "The air current in a mine is the life line, as truly as the flow of the blood through the arteries and veins is the thread of life in the body."

Under ordinary conditions, this statement is true; but there are occasions when the air current carries death and destruction to those working in coal mines, as truly as poisoned blood in the arteries carries death to the body. Such conditions require emergency treatment at the hands of a skilled physician, if life and property are to be saved. The experience of the writer has been such as to convince him that it should be made compulsory by law that all coal companies equip their mines with reversible fans.

In the discussion of this question, let us not confine ourselves to the opinion of any one or more persons; but, rather, pay heed to those who have had to do with the saving of life and property under circumstances similar to those named in the Foreword. In deciding the question of whether mine fans should or should not be built reversible, we should be guided by the results obtained in past experience, comparing the many lives and property saved and lost where reversible and nonreversible fans were in operation. Let us have facts and not opinions on such an important subject; let us rely on those who have had actual experience with both kinds of fans.

At midnight, Jan. 14, 1902, the tower, shaker screen and building, at the Maplewood Coal Co.'s No. 1 mine, located at Farmington, Ill., were on fire. On arriving at the mine, the writer found the fire going down the hoisting shaft, which was the downcast. We learned that no one was in the mine, but there was danger of setting fire to the shaft and the timbers at the bottom, as well as the mule stables containing 12 mules. To prevent this, we at once reversed the fan, thereby making the hoisting shaft the upcast. We then descended the fan shaft and, after seeing that the mules were safe, stationed men at the bottom of the hoisting shaft to extinguish burning timbers of the tower, as they fell into the shaft. The fire destroyed the tower and dump building, but the shaft and mules were saved.

Dec. 9, 1904, a fire was started on the main intake entry, at the Sholl Brothers' mine, located at Bartonville, Ill., by a trapper dropping his lighted lamp on a quantity of hay, which had been allowed to accumulate at the door that he was tending. The fire burned the door, the timbers and all combustible material for a distance of several hundred feet along the main entry. The mine timbers were burning fiercely and, the hoisting shaft being the downcast, the air current (life line) was conveying the smoke and fire toward the working face, where 121 men and boys were working. The engineer reversed the fan, thereby reversing the air current, which prevented the fire and smoke from reaching the men and gave them sufficient time to climb the ladder in the escape shaft. The stairs had not yet been placed in this shaft.

Let us make the LIFE LINE in the mine so that we can use it to advantage whenever occasion may require.

JAMES TAYLOR,

Mine Inspector, District No. 4.  
Peoria, Ill.

*Letter No. 4*—In the construction of a ventilating fan for a large mine, especially a gaseous mine, it is always advisable to arrange the ventilator so that the air current can be reversed promptly in case of need. In the mine, the reversal of the air current will, of course, tend to open all the doors, to a greater or less extent, depending on the force of the current, which will prevent a large portion of the air from circulating through the mine. It is, however, often necessary to produce this change in the direction of the air current, in order to allow rescue parties to enter the mine; and, in case of fire, to drive back the gases that would otherwise be carried into the workings and suffocate the men before they could make their escape.

The ventilation of a large and gaseous mine should be carefully arranged with respect to such emergencies as these. Escapeways should be provided and kept open by which the men can get out of the mine quickly and safely when an accident occurs.

My opinion is that, in case of fire or explosion occurring in a mine, the direction of the air current should not be changed until the rescue parties have entered the mine to determine whether or not this should be done. However, should the mine fan, not be built reversible, and an accident should occur in the mine, and the

rescue parties found it advisable to change the direction of the air current, there would undoubtedly be considerable delay and much valuable time lost before men could enter the workings and rescue those who were still alive. On the other hand, if the fan is built reversible then the air current can be changed at once if desired and it is thought best; or continued in the same direction, as the conditions in the mine may require.

GEORGE STOCKDALE,  
FIREBOSS.

Percy, Penn.

*Letter No. 5*—The proposition to construct only nonreversible ventilating fans, at all collieries, seems to be based on fallacious reasoning. With all due respect for the opinions of many practical mining men who may claim that under no circumstances should the air current, in a mine, be reversed, we are convinced that any hard-and-fast rule based upon their conclusions, would be dangerous in the extreme, and in some emergencies prove a positive menace to life and property.

Mine fires and explosions of gas are the principal occurrences that might necessitate reversing the air current, in a mine. Many mine fires originate in the intake airway, which is generally used for transportation. Here, the force of men engaged in hauling the coal from the chambers to the shaft or slope bottom are busily engaged. Here, the danger from incipient mine fires is greatest. Naked lights are used and the carelessness of a boy or man may start a dangerous blaze along the dry, timbered haulway.

Confronted by such a condition, the safety of the men engaged in the inside workings demands that the air current be reversed or that the fan be stopped. If this is not quickly done the dangerous gases generated by the fire in the intake will be wafted in to the men in the chambers, causing suffocation and death all along the line of the current.

This is one of the possible emergencies where the intelligence and knowledge of the foreman in charge is called into play. He must act quickly. His knowledge of local conditions will suggest the proper course to pursue in regard to reversing the current or short-circuiting the air, if he is properly qualified to fill the position he holds.



All well-managed mines are now equipped with telephone communication. This enables the foreman to get in touch quickly with his assistants in every section of the workings. The blaze in the intake makes quick thinking and action necessary. Life and property are in danger. Safety to both depends on a quick-acting mind and a correct judgment.

What should the foreman do? Common sense and intelligence will dictate his action. If the mine is nongaseous the fan should be reversed promptly. This will prevent the dangerous gases generated by the fire from being carried into the workings; and the men can be taken to the surface through the fresh air of the outlet or return airway, which has, by this means, been transformed into an intake.

If the mine is gaseous, the safety of the men at work in the chambers, here also, demands that the fan be reversed, with the additional precaution that only safety lamps be used; since the reversed air current may fill the intake with an explosive mixture of gas and air. This will, however, give the men and boys a chance to reach the surface in safety, through the newly constituted intake. When the men have all reached the surface the foreman in charge can concentrate his whole energy on the problem of quenching the fire.

Mine managers, like doctors, differ on important matters. The serious loss of life in the oft-recurring mine catastrophes shows that the judgment of some is not always right. A discussion of this matter cannot fail to yield good results.

Freeland, Penn.

GEO. MCGEE.

**Letter No. 6**—In my opinion, all ventilators at gaseous or nongaseous mines should be constructed and arranged so that the air current can be reversed promptly, in case of emergency; and, also, to suit the special conditions in the mine. In some mines, it is necessary to change the ventilation at least twice a year, to suit the varying conditions that exist in the mine; while, again, there are other mines in which the ventilation is never changed. But that is no reason why the fan should not be constructed so that it can be reversed in case of need.

However, the changing of the fan and reversal of the air current while men are in the mine must be done with caution. No mine foreman should decide to change the ventilating fan or current without first consulting the superintendent, or his assistants. It is often necessary to change the direction of the air current so that rescue parties can enter the mine; and in case of fire to drive back the flame and gases, and control the fire.

The ventilation of a mine should be planned to meet any emergency that can reasonably be expected to arise in the

operation of the mine. I am not in favor of reversing the air current while the men are in the mine, unless it is positively known that this is necessary to save human life.

I think it is only right and proper that all large mines should be equipped with reversible fans as that provides two chances instead of one.

HENRY MCCLUSKEY,

MINE FOREMAN.

Cecil P. O., Washington County, Penn.

**Letter No. 7**—In regard to the question of equipping mines with reversible fans, will say I am in favor of the reversible fan. While I am ready to admit that good argument can be produced on both sides of this question, I still think there is more to be gained than lost by installing a reversible fan. Between these two evils it is better to choose the least.

Only during the last summer I visited a mine to inspect it and when I got inside I found the superintendent and a few men trying to get into a part of the mine where a fire had previously been raging, and were being driven back.

I first inquired the nature of the trouble, and the superintendent explained that the air shaft had caved in. This shaft was at the far end of the workings and a disk fan, of the propeller type, was blowing the air into the mine. A new opening had recently been made for a water shaft, but this was not available as an air shaft because it had been bratticed off.

When the air shaft caved the heading leading to the water shaft filled with blackdamp, forced there by the action of the blower; and men could not get to the brattice to take it down. It could not be reached either from the inside or the outside.

I asked the superintendent to send his electrician to the fan to change the motor so as to make the fan exhaust instead of blowing the air. It was only a short time till men got to the brattice from the outside, at the new opening. A few hours later it was possible to reach the point in the mine which for several hours they had fought to reach. This is only one instance of many which could be given in favor of the reversible fan.

ALEX. SMITH,

MINE INSPECTOR, District No. 6.  
New Philadelphia, Ohio.

## Anthracite Waste

Referring to your editorial of Oct. 19, answering my comment on "Wastes in the Production of Anthracite Coal," would say that you have made clear my opinion in the last three paragraphs of your editorial of the 19th.

The paper you quote, by William Griffith and myself, entitled "Our Anthracite Coal Supply and Its Conservation," which is part of the transactions of the Eighth International Congress of Applied Chemistry, recently held in New York, together with my articles in your paper of one year ago, embody the conditions as I see them.

As stated therein, decided improvements have been made in the preparation of anthracite coal in recent years, by many of the producers, and in underground practice by some; but speaking broadly, the *methods of mining* have not materially changed since the publication of the report of the "Coal Waste Commission," of which the late Eckley B. Cox and William Griffith were members.

Consequently the yield of raw material from the mines cannot be much, if any greater, than indicated by that report. On the contrary, on account of the greater depth of mines and the consequent greater weight of overburden, a less percentage of recovery is likely. This is especially true in the thick and steep pitching beds of the Southern fields.

While the Bureau of Mines, in Bulletin 47, does not say that the 50 per cent. waste of anthracite is in the mining and preparation, I think such was intended.

ELI T. CONNER,  
Mining Engineer.

1134 Real Estate Building, Philadelphia, Penn.

## Carpet Bagging and Its Effect on Mining

I want to say that I heartily indorse all that Mr. Reynolds said in his article on "Carpet Bagging and Its Effect on Mining," COAL AGE, Sept. 21, p. 387. Much more could be added without exaggerating the evil arising from the dissatisfied feeling among miners, which causes them to change frequently from one place to another. All mine foremen are confronted with this difficulty. It is one of the annoyances and hindrances to good mining. I might add that, in some cases, there is opportunity for the mine foremen themselves to set a good example in this regard.

In Durham, England, most of the miners, born and reared in the same village, have worked in the same mine all their lives. I have been here, in this country, myself, about ten years; but would feel pretty safe in saying that all of the mine foremen who were in Durham at the time I left there, still hold the same places they held then, except a few who have joined the great majority. What surprises me most, however, is that as soon as the English miner comes to this country, he seems to get the moving fever. He is more restless even than the American-born miner.



We all know it is easy to find fault, but not as easy to find a remedy for existing evils. The man who can suggest the remedy is the real benefactor; and if any man can tell what will make miners more satisfied to settle down and keep them from running from place to place, in this country, he will be doing a great thing for mining.

A short time ago I visited the anthracite-coal fields, and found the moving habit not nearly as bad there as it is in the bituminous field, notwithstanding the fact that the men do not get nearly as much money there as here. A Polander, with whom I was talking, told me he had been working in the same mine over 25 years. He had a nice house and garden of his own. I was told that this was no exception; and, indeed, it seemed to me that the ambition of many of these anthracite miners was to become American citizens and to own a property. I fail to understand why the miner in the bituminous field is more discontented, unless it is that some of the anthracite companies are doing more to make the home surroundings of their men attractive and comfortable.

The custom of hiring a man for a stated period, in mining, has long since been abandoned and rightly so. Now, the company that can make conditions in and about the mine the most attractive to the men are more successful in securing a satisfied class of miners. Everything does not depend on the mine foreman, although he can do much to alleviate conditions in the mine.

Without presuming to give advice, but having studied the situation from the standpoint of the men, while living among them, I would suggest that one cause of dissatisfaction is that a large percentage of foreign labor coming to this country and going into the mine are from the agricultural districts of Europe. This class of labor is ignorant and superstitious. The average intelligence of this class is dwarfed, and they fail to see things in the same light as the experienced miner. They have been drawn to this country by the stories that have reached them of good money made by their countrymen here. It is safe to say the majority of these are disappointed after working a few months in this country, and they wander from place to place seeking better work and more pay.

Another feature is the advantage that the mine foreman generally takes of this class of labor. Often, they require them to do extra work for which they receive no pay, the mine foreman trying to cut down expenses in this way. It is always a mistake for a foreman or assistant foreman to think he can get better work from men by bullying and swearing at them than by fair treatment. A good man soon tires of such bossing and seeks a better place. It is true that the mine foreman has much to tax his patience as

he has all kinds of men to deal with. A man will be idle for several days or a week, and when he finally turns up at the mine, gives as an excuse that he has been sick; while in truth he has been away working on a job at another mine, but finding it no better or worse than the one he had, returns to his work.

A great deal could be done to avoid the evil I have mentioned if mine foremen would agree together on some plan by which miners should be hired and receive an honorable discharge. It may seem a hardship to require a ten-days' notice of any man before he can get his time; but, in the meantime, a simple note from a mine foreman stating that the man had been employed so many years, months, or days, could be presented to the foreman at another mine, and would indicate that the man was all right. If some such plan were to be adopted and followed, men would soon understand that they could not get a job at any mine without a recommendation from the mine where they had worked last. Such a plan of hiring and discharging men would save thousands of dollars by making the men more efficient and securing a better class of miners. The mine would be safer, and there would be fewer accidents.

THOMAS HOGARTH.

## Foreign Labor and the American Miner

Reading in one of the recent issues of COAL AGE (Sept. 21, p. 406), Mr. Donaldson's remarks on Avoidable Mine Accidents, I notice he suggests the employment of what he terms "safety bosses" in mines, and specifies what he considers would be the duties of such an official.

I cannot understand why we should advocate the teaching of ignorant foreigners, who are wholly unacquainted with the mining of coal, when there is always a surplus of experienced, English-speaking miners who are willing and ready to work where conditions are not intolerable and a living wage can be earned.

I have noted in some mining districts a decided preference is given to the foreigner, and every effort is being made to teach him how to timber his working place and to mine and shoot his coal. Is this effort on the part of the operator to employ and teach the foreign miner, an attempt to take advantage of his imperfect knowledge of the contract existing in the unionized states between employer and employee?

Since the passing of the mine law, in Illinois, relating to the qualification of miners, in 1897, which was finally amended and approved June 5, 1909, I have seen preference given to foreigners holding certificates showing two years of experience, while certificated miners of over 20 years' experience were refused

work, in the same mine. It is clear that where such a condition prevails, *safety is not the first consideration*, in the operation of the mine.

Harrisburg, Ill.

MINER.

[We publish the above remarks of our correspondent because they draw attention, incidentally, to one of the recognized evils in the operation of mines today. We refer, not to the education of the inexperienced and often ignorant class of labor taken into the mine, but to the certification of such labor, qualifying them to be employed as miners; and to the possible advantage that may be taken by mine operators, at times, by the employment as miners, of men having a limited mining experience and knowledge, because they are willing to work for a time under conditions that would not permit an experienced miner to earn a living wage.]

This is a broad question and worthy of earnest discussion. It is not in the interest of good mining to allow conditions to prevail that will eventually drive the experienced miner into other fields of labor, because he considers the conditions under which he is obliged to work as unsafe, or as not yielding a sufficient income, which he has a right to regard as a living wage.

The argument, however, is not all on the miner's side. The investment of large capital and the risks undertaken in the operation of mines must be considered; and, in contrast with the so called "living wage," must be regarded the fair percentage of profit, which is the right of the owner or the operator whose capital is invested. We hope to hear further from both sides of this question. —EDITOR.]

## The Mine Foreman's Relations to the Company and Men

Realizing from experience how important it is that a mine foreman should know how to hire men, I offer the following suggestions, which I hope will be accepted in the spirit in which they are given:

A foreman must consider the lives of the men he already has in his charge as well as those he is about to hire. He must consider the company's property and equipment, including all machinery, mules, tools and material, and maintain these in the best possible condition, and avoid waste and misuse of the same.

He must learn to be a good judge of men and should never hire any man as soon as he makes application for work, unless it be a man who comes well recommended and whom the foreman knows to be all right.

A mine foreman should know exactly the capacity of his mine and what coal

a good average miner will produce; and should employ enough "diggers" of the right class to meet these conditions, or to mine and load the required output of coal. He must provide enough drivers to handle this output properly, besides cagers, trackmen, machinemen and the necessary number of shift hands to keep the roads and mine in good and safe condition.

If a foreman hires every man who makes application for work, he will find a large number of them will not give satisfaction in the mines; many will be out of the mines when they are most needed, will not take proper care of the company's houses they occupy, will overdraw their store account if not carefully watched, and in many ways prove as worthless as a dead horse.

The mine foreman must thus, at all times, have in view the interest and welfare of his company, in regard to their stores and the houses they have for rent. By precept and example, he must encourage a clean and good appearance in the men he employs. Often, when work is scarce and a number of houses are standing idle, the mine foreman is compelled to give preference to a married man who will rent one of the company's houses, so long as the man is a good workman and a good citizen. By this method, the company houses are kept well filled with a desirable class of men; and, in the end, what is for the best interest of the company, adds to the comfort and welfare of the men.

If the mine foreman is a good judge of human nature, he will treat his men with tact and kindness. All men worthy of respect should be treated with respect, and a good foreman will never make a promise that he cannot fulfill. Have a "Good morning" and a kind word for the men, in passing. Look well after their working places; and see that these are properly ventilated, and that each man has the supply of timber he needs to make his place safe. Give each man a square turn, and never allow one man an advantage over another; but, as long as conditions will permit, give every man the same show and treat all with equal fairness and justice, which is the only safe rule.

Never allow a man to violate a rule without administering a sufficient rebuke; and, if such action is justifiable, discharge him; but first be sure you are right in doing this and that your action will merit the support of every fair-minded man.

If mine foremen would adopt these and other like principles, and act upon them, they would do much toward making good miners.

W. R. GARRETT,  
Mine Foreman,  
McHenry Coal Co., Colliery No. 3.  
Ehols, Ky.

## The Fireboss as Assistant Mine Foreman

I believe the real work of the fireboss should be to assist the mine foreman, after he has completed his morning inspection and reported the mine safe for work.

In our institute, we have been discussing, again, the work of the fireboss and his responsibility for the oft-recurring mine accidents. The general drift of the discussion seemed to bear on the fact that the fireboss should be able to devote more of his time to the examination of the working places during the hours when the men are at work.

Owing to the need of reducing operating expenses to the lowest possible limit, there are, in most cases, not enough daymen to do the necessary work, repairing roads, taking down loose top, timbering airways and other numerous things that must be done every day in the mine to keep the place safe for workmen.

Instead of the fireboss giving his time to the inspection of the working places and instructing the men in regard to timbering their places and mining the coal, he is generally sent, by the mine foreman, to perform the work required on the roads, while the foreman visits as many of the working places as his time will permit.

I think that if more attention were given to the inspection of the working places while the men are at work in them, and they were compelled to timber their places better, and to do this the first thing in the morning, resetting any timbers that were blown out by shots the night before, this would go far toward reducing the many accidents that occur at the face. Much attention should be given to see that every shot is carefully prepared and charged before the miner is allowed to fire the same.

JOHN SUTTON,  
Fireboss.

West Terre Haute, Ind.

## Line Construction for Mine Telephones

In the issue of COAL AGE July 27, p. 108, there appeared an excellent and timely article from the pen of E. L. Cole, entitled The Mine Telephone Of Today.

It would be a useless waste of time to elaborate on the advantages of a telephone system, in a coal mine; as this must be apparent to every manager who is trying to keep his mine up to date. A telephone system is as essential to the successful operation of a well-regulated mine, today, as an elevator system is an essential part of the equipment of the modern office building.

For a limited number of telephones, the system described by Mr. Cole will work well; but where the size of the mine requires the installation of a large number of phones, a switchboard and an attendant are essential to an uninterrupted and efficient service. Mr. Cole describes in detail and illustrates by sketches various methods of wiring designed to obtain the best results. Any method of wiring a coal mine is subject to numerous kinds of accidents, which are so well known to most mine managers that they need not be enumerated here. The principal menace to mine telephone service is the danger of roof falls breaking the wires.

In order to reduce these accidents to a minimum and to ensure the perfect working of the telephone system during the life of their mines, at a minimum cost of upkeep, the Western Fuel Company, Nanaimo, B. C., Canada, have adopted a method of line construction, in their No. 1 shaft, that I believe will be of interest to the readers of COAL AGE.

The wire used for this installation is No. 16 B. & S., single braid, copper wire. This wire is threaded through a  $\frac{3}{8}$ -in. galvanized-iron pipe, put together with well-leaded joints, the pipe being then buried in the mine floor. At intervals of 500 ft., in this pipe, there is inserted a 3-in. galvanized tee, with  $\frac{3}{8}$ -in. reducing bushings and a 3-in. plug, to be used for the purpose of inspecting the wires and making any future installations that may be required. At points where telephone connections are to be made, a tee is used and a riser pipe carried up the rib to the phone. The end of this riser pipe is plugged with gutta percha, to insure freedom from moisture in the pipe.

The mine workings where this system is installed are submarine and very extensive, the mine having been in operation for 30 years. About 30,000 lineal feet of  $\frac{3}{8}$ -in. galvanized pipe has been laid in this installation; and the freedom from telephone troubles, and the cost of upkeep bids fair to justify the first cost of installation.

Some five years ago a telephone line was laid by the same company across Exit Passage, an arm of the Gulf of Georgia, and the cost of upkeep has been nil. From the success of that installation came the idea of using it in the mine. The special type of line construction described comes as near to being perfect and free from accident as any of which I know. It is the only type of line construction that may reasonably be expected to survive an explosion in a mine.

THOMAS GRAHAM,  
Chief Inspector of Mines.  
Victoria, B. C., Canada.



# Examination Questions

Selected from State Examinations, or Suggested by Correspondents

## Examination Questions

(Answered by request)

**Ques.**—How would you enter a place that was supposed to contain firedamp?

**Ans.**—Proceed slowly, keeping the lamp down and stopping to make a test for gas, at short intervals. In this manner, take every precaution to prevent walking any distance under a body of gas that may have accumulated in the room, and which may be disturbed by passing under it. In this manner, one may be surrounded by explosive gas before he is aware of its presence.

**Ques.**—How would you remove firedamp from a section of the mine, after an explosion; what dangers would you expect to meet and how would you overcome them?

**Ans.**—This question probably refers to the removal of *afterdamp* instead of firedamp. Afterdamp is the name given to the mixture of gases remaining after an explosion, while firedamp is the explosive mixture of gas and air burned. Before any attempt is made to remove the afterdamp of an explosion in a certain section of the mine, the men should be withdrawn from the other sections. When this has been done, arrangements should be made to increase the circulation of air in the affected section. The work must proceed from the intake end and every precaution must be observed to clear out all accumulations of gas, in regular order throughout the section. It will be necessary, in many cases, to rebuild and repair stoppings, doors and brattices, and erect special brattices to deflect the air current into the rooms. Time must be given to allow the air current to sweep away the accumulated gases; and tests must be made, from time to time, with the safety lamp, to determine the progress of the work.

Owing to the extremely poisonous nature of the gases forming the afterdamp, and because the afterdamp is often fatal to life when the safety lamp gives no indication of the presence of gas, it is necessary to carry caged mice or birds when exploring a mine after an explosion. These small creatures being sensitive to the effects of the gas reveal its presence by their actions, which should be closely observed.

Besides the danger of being overcome by gas, there is always the danger of a fall of roof, occurring in a room or head-

ing, driving a body of gas out on the men and causing another explosion. When the explosion has destroyed many timbers, there is the danger of loose top and roof falls, in the airways. To avoid this it will be necessary to examine the roof closely and reset timbers wherever necessary.

**Ques.**—Explain the meaning of the terms: "post timbering," "double timbering," and "skin to skin timbering," and state under what conditions each is used.

**Ans.**—Post timbering refers to that form of mine timbering where posts or props only, are used, with or without caps. It is used principally at the working face, and in rooms or airways where little timbering is required.

Double timbering is that form of timbering where a crossbar or collar is used, supported on two legs. This constitutes what is called a timber frame. Double timbering is mostly used on haulage roads and air courses where the roof requires attention.

"Skin to skin" timbering describes the method employed for the support of a frail or weak roof where it is necessary to place the timber frames close together. It is only used where the roof is so frail that it breaks and falls between the timbers when they are set apart.

**Ques.**—How should double timbering be done where the bottom is soft?

**Ans.**—The legs of each timber frame should be set on mud sills. Where the floor has a tendency to heave, cross mud sills are used; in other cases, longitudinal mud sills are often employed, laid on each side of the roadway.

**Ques.**—What is the purpose of a cap, in mine timbering?

**Ans.**—A cap or cap-piece is used above a post or prop, for two purposes. 1. It distributes the resisting thrust of the post over a greater area of the roof; in other words, it gives a greater bearing of the post against the roof. 2. If the cap is softer wood than the post, as it should be, the head of the post will be pressed into the cap, which binds it together and prevents the "furring" of the post.

**Ques.**—A volume of 150,000 cu.ft. of air per minute is divided among the three following splits: Split A, 6x8 ft., 2400 ft. long, including the return; split B, 6x14 ft., 4200 ft. long; split C, 6x12 ft., 1800 ft. long. In which of these splits should regulators be placed, and what size of opening will be required in order to ob-

tain the following division of air: Split A, 40,000 cu.ft.; split B, 90,000 cu.ft.; split C, 20,000 cu.ft.?

**Ans.**—The first step is to find the natural pressure required to pass the desired amount of air, in each split, separately, thus,

Split A

$$p = \frac{0.02 \times 2400 \times 28 \times 40^2}{48 \times 48 \times 48} = 19.44 \text{ lb. per sq.ft.}$$

Split B

$$p = \frac{0.02 \times 4200 \times 40 \times 90^2}{84 \times 84 \times 84} = 45.92 \text{ lb. per sq.ft.}$$

Split C

$$p = \frac{0.02 \times 1800 \times 36 \times 20^2}{72 \times 72 \times 72} = 1.39 \text{ lb. per sq.in.}$$

Split B, therefore, requires the greatest pressure per square foot to pass the desired volume of air; and it will be necessary to introduce regulators in splits A and C, to increase the pressure in these splits and make it equal to that in split B, which is the free or open split having no regulator.

The next step is to calculate the pressure or the water gage due to each of the regulators in splits A and C, respectively.

The pressure due to a regulator is always found by subtracting the natural pressure that would be required to pass the air desired in the split, if no regulator were present, from the pressure required in the open split B. The water gage is then found by dividing this pressure due to the regulator by 5.2; thus,

$$\text{Split A, } w.g. = \frac{45.92 - 19.44}{5.2} = 5.10 \text{ in.}$$

$$\text{Split B, } w.g. = \frac{45.92 - 1.39}{5.2} = 8.56 \text{ in.}$$

The sectional area of the opening in each regulator is then found by substituting the values for the quantity of air passing and the water gage due to the regulator in the formula

$$\text{Area of opening} = \frac{0.00038 Q}{\sqrt{w.g.}}$$

Or, expressing the quantity of air in circulation in thousands of cubic feet per minute ( $Q_m$ ) and using the decimal 0.38, the formula is

$$\text{Area of opening} = \frac{0.38 Q_m}{\sqrt{w.g.}}$$

Substituting the given values for splits A and B in this formula gives

$$\text{Split A, Area of opening} = \frac{0.38 \times 40}{\sqrt{5.1}} = 6.7 \text{ sq.ft.}$$

$$\text{Split B, Area of opening} = \frac{0.38 \times 20}{\sqrt{8.56}} = 2.6 \text{ sq.ft.}$$



# Sociological Department

For the Betterment of Living Conditions in Mining Communities

## First Aid Meet in Helena, Mont.

By F. GOOD.\*

At the Montana State Fair held in Helena, Mont., Sept. 23 to 28, 1912, a first-aid contest was one of the features.

The object of the Fair Association was to make this an interstate meet, but the management was unable at that time to get more than one team outside of the state of Montana to participate. This corps was from Roslyn, Wash., and represented the Northwestern Improvement Co. Teams from Red Lodge, Roundup and Washoe also took part in the contest, and one independent corps came from Bear Creek. These were all Montana teams.

There were two events each day for four days. These were as follows:

### SCHEDULE OF EVENTS AT MONTANA STATE FAIR

First Day. Event No. 1. Rescue the subject from smoke (room) and perform artificial respiration for one minute (Sylvester's method). Team event.

Event 2. Treat a fractured jaw and compound fracture of the right forearm accompanied by arterial bleeding. Team event.

Second Day. Event No. 3. Treat arterial bleeding of the right side of the head and a fracture of the left collarbone. Team event.

Event No. 4. Apply triangular bandage (without other dressing) for the following injuries: Cut on top of head, cut on right shoulder, sprained wrist (sling only), burned chest, injured knuckles (when man desires to continue working), cut on thigh, near groin. Two men event. Note: Sprained wrist is on left side, burned chest is on right side. All bandages are to be left in position until examined by judges at the end of the event.

Third Day. Event No. 5. Treat man who has been on an electric wire and was lying face down; rescue, extinguish fire, treat burns of chest and upper arms. Team event. Note: Man is not supposed to be unconscious.

Event No. 6. Treat a compound fracture of the right thigh with severe, arterial bleeding. Make stretcher out of mine materials, place patient on stretcher and carry 50 ft. Team event.

Fourth Day. Event No. 7. Treat a dislocated right shoulder with fracture of ribs on right side, venous bleeding of right side of head and arterial bleeding of right upper arm. Team event. Note: Do not attempt to reduce shoulder dislocation.

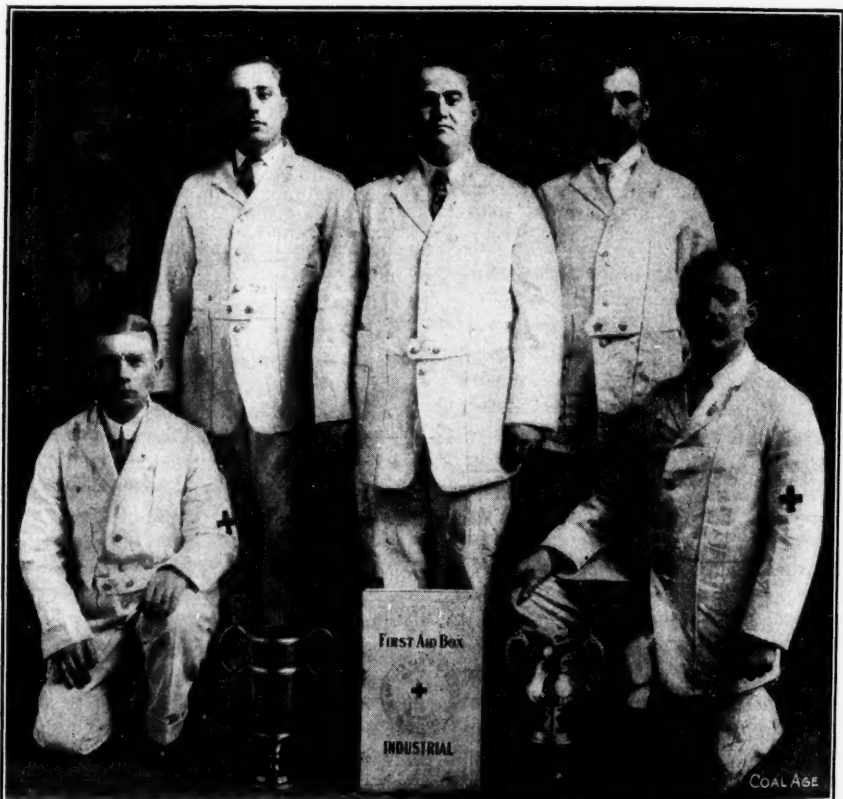
Event No. 8. Treat a drowned person who has a fracture of the right forearm. Two-man event. Note: By "two-man event" is meant a demonstration in

which two men participate not including the subject.

At the close of the events, Roslyn team was declared the winner and received a handsome copper cup, which is shown on the left in the picture. The cup on the right was presented to the team by Clarence R. Claghorn, general manager of the Northwestern Improvement Co., for having won in a similar

contest of the association. C. R. Claghorn, general manager, and J. F. Menzies, general superintendent, both of the Northwestern Improvement Co., in the state of Washington, have taken great interest in the first-aid work.

The Roslyn field is divided into two divisions. Each division has rooms in which first-aid and Draeger work are practiced each night in the week. In



A PACIFIC COAST TEAM FROM ROSLYN, WASH., WHICH HAS DISTINGUISHED ITSELF IN FIRST-AID WORK

contest held at Pittsburgh, Penn., in 1911.

Reading from left to right in the picture, the men represented are Frank Good, manager, James Pasco, Jas. Bagley, captain, Thomas Summerhill and John Parker.

On the night of Sept. 27, the members of the five teams attended a banquet held at the Hotel Grandon in Helena. The outcome of this meeting was the organization of the Northwest First Aid Association, comprising the following states:—Oregon, Washington, Idaho, Montana, Wyoming and Colorado.

J. B. McDermott, state coal mine inspector of Montana, was elected presi-

dent of the association. C. R. Claghorn, general manager, and J. F. Menzies, general superintendent, both of the Northwestern Improvement Co., in the state of Washington, have taken great interest in the first-aid work.

During the month of August, 26 men took Draeger training at Roslyn under the directions of A. A. Flynn, who has charge of the U. S. mine-rescue station at Seattle. There are now 55 men holding mine-rescue certificates, in the employ of that department of the Northwestern Improvement Co. which operates in the Roslyn field. At the same time 39 men secured the Red Cross certificates with creditable grades.

\*Northwestern Improvement Co., Roslyn, Wash.

## An Operator's Gift to a Mining Town

By E. E. LEE\*

The presentation and dedicating of the \$100,000 public library donated to the city of Hazleton, Penn., by John Markle, directing head of the firm of G. B. Markle & Co., in memory of his deceased parents, George Bushar Markle and Emily Robison Markle, took place on Tuesday, October 3, 1912.

### THE DEDICATION OF THE HAZLETON LIBRARY

Geo. F. Baer, president of the Philadelphia and Reading Ry. made the pres-



MARKLE LIBRARY, HAZLETON, PENN.

entation speech on behalf of Mr. Markle, whereupon John H. Bigelow, district attorney of Luzerne County, accepted the building for the Hazleton Public Library Association. Other speakers were D. A. Harman, Rev. August Rohrig,

\*Engineering department, Lehigh Valley Coal Co., 204 Coal Exchange, Wilkes-Barre, Penn.



MAIN READING ROOM OF LIBRARY WITH DEDICATION TABLET

Mrs. W. C. Gayley, John Markle and L. O. Emmerich. At the conclusion of the programme a reception was tendered to Mr. Markle.

The library was designed by Harris & Richards, architects, of Philadelphia. It measures 44x66 ft., is made of white marble. The building is an adoption of Roman Ionic design, and is fireproof, even the book stacks being made of steel.

### THE INTERIOR OF THE LIBRARY

On entering, one faces the delivery desk, which is so placed that the librarian in charge has the entire floor in view. The delivery room is furnished in Old English quartered oak. A filing cabinet, a book case for the latest fiction and the librarian's desk equip this room. The floor is of hard wood, as in all other parts of the library.

The main reading room, on the right of that described fills the whole south end of the building. It is the show room of the library, and it was Mr. Markle's wish that it should be the most sumptuously furnished. It is provided with quartered oak tables and desk.

In addition to the excellent illumination provided by the windows, the tables are lighted by solid brass reading lamps and drop chandeliers. Side-wall lamps light the stacks, in which are kept books of reference and those treating on sociology, science and philosophy.

At the east end is a fireplace, over which hang the pictures of G. B. Markle and his wife, the parents of the donor. The fire-place is finely carved in oak and tiled designs surround the grate. In the center is a brass tablet with the following inscription:

"In Loving Memory of George Bushar Markle and Emily Robison Markle, This Library Was Presented A. D. 1912, To the City of Hazleton, By Their Son, John Markle."

In the reading room are a number of up-to-date library features, among them being magazine shelves which are to be used instead of racks.



DESK AND STACK ROOM WITH PART OF CHILDREN'S DEPARTMENT

# Coal and Coke News

From Our Own Representatives in Various Important Mining Centers

## Wilkes-Barre, Penn.

The convention of the United Mine Workers, which was held last week at Pottsville for District No. 7, showed that the union in the lower anthracite field is stronger than it has ever been. This district struggled along a few years with a membership of less than 4000, but the records now show that there are more than 35,000 men in the organization.

The advances received by the miners at the expiration of their contract during the summer is largely responsible for the increased membership. The success of the colliery committee, which the new agreement provides, also plays a big part in the building up of the union.

There is an increased membership in all of the districts. In district No. 7 there has been an increase of about 200 per cent., and in district No. 1, there has also been a tremendous gain. There is no denying that the union is today stronger numerically than it has ever been before.

### MITCHELL DAY

Miners throughout the anthracite field are planning for a Mitchell Day celebration on Oct. 29. It is the intention to close down all collieries and hold celebrations in all of the mining towns. Former President John Mitchell has been invited to be present and will likely spend the day in the Pottsville region.

In this district and in District No. 7 there will be parades and public speech-making. The union leaders are furnishing the speakers for these events.

### PERMANENT ORGANIZATION OF MINE FOREMEN

Assistant mine foremen in the lower end of Luzerne County have formed a permanent organization. These men claim that they are working under severe conditions. They point out that the miner works anywhere from 7 to 9 hours per day and that the company mule at best works not more than 9 hours. Assistant mine foremen claim they are forced to labor 13 hours per day. They also contend that they are working for less wages than the assistants in other parts of the anthracite fields.

The invitation to assistant foremen to join in a meeting was well received and at the first session there was a large attendance. At the next meeting it was decided to form a permanent organization for the purpose of bettering the con-

ditions under which the assistants are now laboring.

### LAST SESSION OF THE CONCILIATION BOARD

At the last session of the Conciliation Board, consideration was given to several of the grievances from the Lehigh & Wilkes-Barre Coal Co.'s collieries. The miners of the Hollenback colliery claimed they suffered a reduction in yardage prices in the Stanton vein. They pointed out that they were previously paid \$5.23 and \$4.40 for lifting rock and now receive only \$3.30 per yard for the same work. The company contended that the price paid depended on the thickness and hardness of the material. The matter was deferred until the next meeting.

Three additional grievances were heard and the facts presented were all of the same nature. In the claim of the Nottingham miners, an unwarranted reduction in the pay of laborers was charged, but this claim was tabled for further discussion.

President Kennedy presented a claim from the miners of the Panther Creek region, in which it was averred that the Lehigh Coal & Navigation Co. refused to permit the posting of notices on company property. President Kennedy, S. D. Wariner and W. J. Richards are to adjust this matter.

## Pennsylvania

### ANTHRACITE

**Scranton**—Former Mayor J. B. Dimmick is in favor of urging the next legislature to declare null and void the waiver clauses in deeds for surface lands in the hard-coal region. These clauses exempt the companies from liability for damages to surface property, even though the damage results from taking out supporting pillars.

**Wilkes-Barre**—Anthracite coal reached the highest price in history recently, when stove and chestnut sold for \$5.35 a ton, net, f.o.b. mines.

To discuss coal assessments for the coming year, the county assessors met with H. C. Huber, general manager of the Lehigh & Wilkes-Barre Coal Co., and attorneys Frank Wheaton and A. L. Williams. The discussion was of an informal character, nothing definite being decided upon and the matter will be taken up with the county commissioners later.

**Shenandoah**—The Plank Ridge washery, which has been idle a long period undergoing extensive repairs, resumed full operation, Oct. 14, giving employment to 100 men and boys.

**Pottsville**—The Anchor washery of the Philadelphia & Reading Coal & Iron Co., resumed operations, Oct. 15, after a suspension of several months.

### BITUMINOUS

**Evans Station**—The fifteenth and last body of the miners drowned in the Polecat mine, of the Superba Coal Co., on July 24, has been recovered. The company is now planning to materially increase its output and work is progressing in the opening of the new mine, authorized by the directors at a recent meeting.

**Newcastle**—Stockholders of the Newcastle Savings & Trust Co., which closed its doors in 1907, have decided to raise \$100,000 to \$125,000 to purchase the property of the Washington County Coal Co., to be sold at auction Oct. 23, in Washington, Penn.

**Pittsburgh**—Owing to labor troubles in the West Virginia field, there has been an unusually heavy demand for coal upon the Pittsburgh Coal Co., and shipments to Lake regions are expected to reach 6,000,000 tons this year. Last year the company mined about 16,000,000 tons of coal, but its output this year will be much larger, owing, in part, to the acquisition of the Monongahela River Consolidated Coal & Coke Company.

**Big Run**—Clover Run coal mines, which have been closed down for some months, owing to some misunderstanding with the miners, are being put in shape for running.

## West Virginia

**Charleston**—It is reported that coal operators on Paint and Cabin Creeks, where martial law has recently been revoked, will, in the future, employ no detectives as mine guards or any others as watchmen against whom objections are made by the military authorities.

## Alabama

**Birmingham**—Reports from the various coal mining centers of Alabama show that the coal production is holding up and the indications are that the 1912 output will exceed 18,000,000 tons, breaking all previous records. Despite the car shortage which has hampered the



coal operators to a certain extent, few of the mines have closed down or reduced their daily production.

**Montgomery**—Following the report by State Mine Inspector Nesbitt to Governor O'Neal, the solicitor of Tuscaloosa County has been asked to investigate the advisability of instituting proceedings against the foreman of Abernant mine. It will be recalled that a disastrous explosion occurred at this mine on Aug. 13 resulting in the loss of 18 lives.

### Kentucky

**Richmond**—Judge John C. Chenault, of Richmond, Ky., receiver of the Big Hill Coal Co., recently sold the Blanch mines, owned by that company, to E. O. Golden, of Pennsylvania, for \$63,600. The mines are located south of Richmond on the Louisville & Nashville R.R.

### Missouri

**Carthage**—A drill hole on the old Kiheka lease, south of Carthage, has shown a 3-ft. bed of coal encountered at a depth of 40 ft. The coal is soft and is said to make a good fuel.

### Ohio

**East Liverpool**—L. D. Allison and Jos. McDaniels have opened up a bank of coal on the former's farm in Middle Run.

**Columbus**—The announcement is made that the general offices of the Baltimore & Ohio Coal Co., which have been located in the New Hayden Bldg., for a number of years, will be moved to the Rockefeller Bldg., Cleveland, in the near future. This will take from Columbus one of the large operating companies in the eastern Ohio district.

### Indiana

**Terre Haute**—According to reports made to the Indiana Railroad Commission, 1200 miners were idle in Linton, Greene Co., on Oct. 11, on account of a lack of cars. A similar condition prevailed on Oct. 16. The United Fourth Vein Coal Co. reports that it is now over two weeks behind on orders at the mines on account of the car shortage.

**Clinton**—An explosion in the Oak Hill mine in Vermillion County, badly wrecked the workings, and is thought to have caused the death of two miners. These two men were firing shots after the regular working hours when it is believed that the mine dust was ignited. A searching party was immediately formed, but it was three hours before a current of air could be started into the mine. Extensive repairs will be required before mining operations can be resumed.

**West Terre Haute**—The record of two options by Richards & Sons Coal Co., in Prairie Creek Township, of Vigo County, gives promise of new coal mines in this

locality. It is announced that a test hole has been sunk near Johnson Hill on the Prarieton Road, revealing a fine bed of good coal. The indications are, therefore, that this part of the county may rival the celebrated fields of Fayette Township.

### Illinois

**Stanton**—Because officials of the Mt. Olive and Stanton Coal Co. did not provide him with a gentle mule, or warn him of the viciousness of the one selected by him, Chas. Smith, a miner, has filed suit for \$5000. His skull was fractured when the animal kicked.

### Kansas

**Pittsburg**—Development of the southern Kansas coal district to the north of Pittsburg, has reached a stage where it is safe to anticipate a heavy output in the near future. Already the Hamilton Coal Co.'s new mine, one mile north of Arma, Kan., is turning out 400 tons daily while the capacity of the colliery, which is 1000 tons, will probably be taxed when the ground is sufficiently developed.

### Oklahoma

**Ardmore**—A deal was consummated, Oct. 12, by which the Folsom-Morris Co. became the owner of valuable coal land at Midway, Okla., formerly owned by L. B. Anderson and others. The mining trustees of the state have approved recently the transfer of 8000 acres to the same company, which now owns all the mines in the Lehigh field.

**Muskogee**—The Bollen-Darnall coal company, a corporation owning and operating five mines in Oklahoma and Arkansas, were placed in the hands of receivers, Oct. 12. W. E. Beauty and L. S. Mehr were appointed receivers.

### Foreign News

**Hobart, Tasmania**—It is now believed that forty-five miners have perished in the North Mount Lyell mines, which caught fire, Oct. 12, through the blowing out of a motor fuse. Fifty-one workers imprisoned on the 1000-ft. level, have been rescued.

**Berlin, Germany**—The Prussian government, an extensive mine owner, has withdrawn from the German Coal Trust as a protest against the raising of prices.

**Edmonton, Alberta**—The Pambina Coal Co., which owns 10,400 acres of coal field situated on the main line of the Grand Trunk Ry., sixty miles west of Edmonton, will produce three hundred tons of coal a day, beginning early next year. The Pambina Coal Co. is a subsidiary company of the Western Canada Land Co., Ltd., and Sir Ronald B. Lane is president. The coal fields were purchased by the Western Canada Land Co.

and transferred to the Pambina Co., which was incorporated in 1910.

**Minto, New Brunswick**—The first shipment of coal for commercial use from the new mine at Minto has been received at Fredericton. This mine, in addition to supplying 100,000 tons annually to the Canadian Pacific Ry., is expected to supplant Nova Scotia coal in New Brunswick for steaming and general purposes.

### Personals

S. L. Alfred, a resident of Centralia, Wash., has commenced proving up on a coal claim in the Cowlitz Pass Coal district in western Washington.

John G. Manes, of New Castle, Penn., has become part owner of a large tract of coal underlying land in the Richland district. There are 1023 acres in this tract.

J. M. Fitzgerald, president of the Davis Coal and Coke Co., has been elected vice-president of the Western Maryland Ry. Co., and will make his headquarters in Baltimore.

Geo. W. Swartz, who has been running the Rock Bar colliery at Langdondale for some years, has made sale of the property. Mr. Swartz expects to operate a mine further up the run in the near future.

P. J. Rogers, of Ensley, Ala., Superintendent of Pratt Mines No. 1 Division of the Tennessee Coal, Iron & Railroad Co., who went to Johns Hopkins Hospital, at Baltimore, Md., a few weeks ago to be operated on for gall stones, has returned greatly improved in health.

Five hundred employees of the Lincoln Coal & Coke Co. at Keister, Penn., recently presented superintendent B. R. De Priest with a handsome gold watch and chain. Mr. De Priest is leaving Keister to go to the W. J. Rainey plant at Royal. His place will be taken by B. B. Leichter.

H. T. Sweeney, who for the last seven years has been general superintendent of the Bache-Denman coal-mining interests, has resigned his position to accept one with a large gold-mining concern in southern California. Mr. Sweeney formerly made his general offices in Ft. Smith, Ark.

George C. Atkinson, president of the St. Bernard Coal & Mining Co., and Frank G. Rash, vice-president and general manager of the same company, have returned to the St. Bernard mines at Earlington, Ky., after a visit to Louisville, where they attended the 1912 convention of the Grand Lodge of Masons.

Oscar Cartledge, State Mine Inspector of the 12th District, has been appointed manager of the Illinois Mine Rescue Stations, the appointment being made by the mine rescue commission, following a State civil service examination, October 3 and 4 at Springfield. Mr. Cartledge began his mining experience as a trapper.

A special train is being made up at Chicago to carry a party of coal operators and capitalists to the American Mining Congress which convenes in Spokane, Nov. 25-30, 1912. Associated with J. F. Callbreath, secretary of the Congress, are, H. N. Taylor, president of the Illinois Coal Operators Assn.; John Mayer, president of the Mayer Coal Co. Carl Scholz, president of the Rock Island coal interests; and several other prominent coal operators.

A. H. Elliott, L. D. Huntoon and B. Stoughton, who recently associated themselves for the general practice of mining, metallurgical and chemical engineering, with offices at 165 Broadway, New York City, have proved that the field for research work and investigation in industrial chemistry is a profitable one for engineers of standing.

### Publications Received

THE COKING OF COAL AT LOW TEMPERATURES. By S. W. Parr and H. L. Olin. University of Illinois, Engineering Experiment Station, Bulletin No. 60.

METHODS OF DETERMINING THE SULPHUR CONTENT OF FUELS. ESPECIALLY PETROLEUM PRODUCTS. Technical paper 26, Petroleum Technology 2. By Irving C. Allen and I. W. Robertson.

### Trade Catalogs

HYATT SLATE NO. 2. HYATT ROLLER BEARING CO., NEWARK, N. J. Showing the advantages of using Hyatt roller-bearing wheels.

BULLETIN 4025, Ingersoll-Rand Co., 11 Broadway, New York City, describes the "5-F" Electric-Air rock drill, which will drill holes 1 3/4 to 2 3/4 in. in diameter up to 20 ft. deep, 5 1/2 in. diameter, cylinder, 8-in. stroke, uses octagon steel, and will drill a 30-in. hole without change of bit.

CATALOG 384-F, issued by Ingersoll-Rand Co., 11 Broadway, New York City, gives instructions for installing and operating Temple Ingersoll Electric-Air Rock Drills, and Form 601 gives instructions for operating the 5-F machine, together with list of duplicate parts.

BULLETIN 4023, describes and illustrates the "4-E" type of Electric-Air drill manufactured by the Ingersoll-Rand Co., 11 Broadway, New York City. This machine will operate with either alternating or direct current; has a cylinder diameter of 4 1/4 in., 7-in. stroke, and will drill a 1 1/4 to 2 in. diameter vertical hole up to 12 ft. deep.

FORM 4209, 16 pages, 6x9 bulletin, issued by the Ingersoll-Rand Co., 11 Broadway, New York City, describes the Temple Ingersoll electric-air rock drill manufactured by them. The "Electric-Air" drill is driven by pulsations of compressed air created by a pulsator actuated by a standard electric motor. The air is never exhausted, but is simply used over and over again, playing back and forth in a closed circuit.

THE TRAIL OF A PIONEER. AMERICAN ENGINEERING CO., MACHINISTS AND FOUNDERS. PHILADELPHIA, PENN.

An extremely unique as well as artistic publication, with short descriptions of "fourteen representative plants among several hundred which have been equipped with Taylor stokers." Both internal and external views are given of some of the finest and most economical power plants in this or any other country.

### Construction News

**Provo, Utah**—The Knight coal road, which runs from Helper through Spring Cañon to the Knight coal field, is practically completed. This road is five miles in length. The grading, bridging, and laying of the rails has all been done within the last three months.

**Denver, Colo.**—Newman Erb announced at Steamboat Springs, the terminus of the Denver, Northwestern & Pacific, that two branches would be built to tap the coal fields in Routt County immediately. One about 10 miles in length taps rich bituminous fields, and the other 20 miles long, is to be through an anthracite field.

**Birmingham, Ala.**—The Tennessee Coal, Iron & Ry. Co. has just purchased two 55,000-ft. low-pressure turbine blowers from the Ingersoll-Rand Co. to install as additional blowing units at their Ensley blast furnace.

The Woodward Iron Co. is also installing turbine blowers at their Woodward furnace.

**Salt Lake City, Utah**—Preparations are being made for the completion of a line to tap the large coal properties of Emery County by the Utah Coal Ry. Co. Six parties of engineers were at work during the summer locating routes, but no decision has been reached yet as to which one will be selected. A large force of men will commence work as soon as the route is settled.

**Acmar, Ala.**—The Alabama Fuel & Iron Co. is preparing to open a new slope at Marguerite mine No. 3. The new slope will be electrically equipped and have a capacity of about 750 tons daily.

The company will also build a central electric power plant at Acmar, to distribute power within a radius of eight miles, which will cost approximately \$80,000.

**Edmonton, Alta.**—Three hundred miles of electric railway connecting Edmonton with numerous towns, coal mines, and gravel deposits, grain and dairy districts, brick, concrete and other manufacturing plants in central Alberta, will be built by the Edmonton Inter-Urban Ry. Co. This company, incorporated under the laws in the province of Alberta in 1910, and reorganized Sept. 6, 1912, is financed by French and Canadian investors.

**Winchester, Ky.**—Definite plans for the development of Eastern Kentucky coal lands by railroad extensions have been made by the Louisville & Nashville R.R. This company has awarded the contract for a cut-off from Winchester to Irvine. A similar cut-off, 11 miles in length, is in course of construction between Beattyville and Winchester, and when these lines are in operation the movement of coal from the mountain fields to Winchester and thence to Eastern and Middle Western markets will be greatly facilitated.

**Nokomis, Ill.**—Mr. J. E. Rutledge, of the Rutledge & Taylor Coal Co., St. Louis, Mo., also president of the Nokomis Coal Co., has just awarded a contract to the Roberts & Schaefer Co., engineers and contractors, McCormick Bldg., Chicago, for the designing and building of a complete fireproof coal-mining plant of large capacity, to be built at Nokomis, Ill. Contract price approximately \$125,000.

This plant will, in many respects, be similar to the large plant which the above company erected for the United Coal Mining Co., at their mine No. 2, Christopher, Ill., which is operating very successfully.

### New Incorporations

**Nashville, Tenn.**—The Sanders Coal Co., of Nashville, Tenn., has dissolved and gone out of existence.

**Boston, Mass.**—The United Fuel Co., Boston, Mass.; \$50,000; Charles B. Mosely, John C. Foster, William B. Blatt.

**Dover, Del.**—Wilbren Hocking Coal Co., Dover, Del.—Capital, \$100,000. Incorporators, J. Santora, J. J. Pheelan, E. D. Dietze, New York City.

**Scranton, Penn.**—The Clearview Coal Co., Scranton, Penn., filed notice of increase of capital stock from \$10,000 to \$100,000, and of issuance of \$200,000 of bonds.

**Indianapolis, Ind.**—The Garstang Fuel Co., of Indianapolis. Capital stock, \$60,000. Directors, Wilfred R. Garstang, Collin B. Gilchrist and Lawrence B. Cummings.

**Belleville, Ill.**—The Oakdale Coal & Mining Co. has been incorporated here with a capital of \$6000, the incorporators being E. Harding, David Williams and R. V. Gustin.

**Jefferson City, Mo.**—A charter has been issued for the Oil, Gas & Coal Co., of Novinger. Capital, \$4000. The incorporators are B. D. Novinger, J. P. Reiger, and F. M. Gilliland.

**Dover, Del.**—The Allied Gas & Electric Co., capital stock \$100,000; to manufacture and generate electricity, gas, etc., and to supply the same. Incorporators, E. G. McWhiney, J. W. Maloney, M. P. Coffin, all of Wilmington, Del.

**Black Fork, Ohio.**—The Cambria Clay Products Co. has been incorporated with a capital stock of \$75,000, to mine and sell coal. The incorporators are Simon Labold, David D. Davis, George M. Appel, Simon Reitz and Edward J. Doshler.

**Detroit, Mich.**—Tom Moore Coal Mining Co., of Detroit, Mich. Coal, oil and gas. Capital stock, \$150,000. Incorporators, Charles T. Moore, John E. S. Koehler, W. R. Brown, John W. Brawley, Wirt I. Savery, all of Detroit, Mich.

**Nashville, Tenn.**—A charter has been granted to the Fresno Coal Co., of Campbell Co. This company has a capital stock of \$5000, and the incorporators are F. A. Wenber, Burt Facinoli, John Frola, Augustine Scaffella and Geo. Belbina.

**Lansing, Mich.**—The Baneroft Coal Co. have filed articles of incorporation. The company is formed largely of Saginaw capitalists headed by E. Hamilton and Wm. Brown. The new company plans to mine coal and shale in Shiawassee County.

**Ogden, Utah.**—The Lion Coal Co., Ogden, Utah. Capital, \$1,000,000. H. H. Rolapp, president; M. S. Browning and W. H. Wattis, vice-presidents; E. S.



Rolapp, secretary. The company owns 665 acres of coal land in Sweetwater County, Wyo.

**Bream, W. Va.**—Cespe-Kanawha Coal Co., of Bream, W. Va., development of coal property. Capital stock, \$50,000. Incorporators, B. E. Specht, Maud T. Specht, Geo. E. Keim, Johnstown, Penn.; R. S. Stilman and Buckner Clay, of Charleston, W. Va.

**Moundsville, W. Va.**—Parros Run Coal Co., of Moundsville, W. Va., to operate coal mines in Marshall County, W. Va. Authorized capital, \$100,000. H. W. Hunter and C. H. Hunter, of Moundsville; David Levy, Blanche Levy and Ben H. Levy, all of Wheeling.

**Corydon, Ky.**—The Corydon Coal Co., of Corydon, Ky., has resumed operations after having completed extensive improvements. A new power plant and screening equipment have been installed at the Corydon mines and the property has been generally renovated.

**Jackson, Ohio.**—The Rowland Block Coal & Clay Co., of Jackson, Ohio, has been incorporated with a capital of \$100,000, to mine and sell coal, among other things. The incorporators are W. C. Martin, John W. Aten, E. O. Roberts, David Armstrong and Ben C. Bentley.

**Phoenix, Ariz.**—The Wonder Mining Co. has been incorporated with a capital of \$1,000,000, and principal offices in Phoenix. It is difficult to determine from the articles of incorporation just what field of human endeavor is not covered by this company, but it is reasonably certain that they intend to acquire, operate and deal in coal and coal land.

**Lexington, Ky.**—Articles of incorporation for the Diamond Coal Co. have been filed. Lexington is the chief place of business. The company will develop coal lands near East Bernstadt, Ky., having leased about 1500 acres of coal land, which is rich in the Jellico variety of coal. Promoters, Louis des Cognets, T. L. Young, and L. C. Derickson, all of Lexington.

**Manchester, Ky.**—Manchester Coal & Coke Co., of Kentucky, with principal offices in Manchester, Ky., and operations in Clay County, Ky., to mine coal, manufacture coke, drill for oil and gas, and manufacture lumber. Authorized capital stock, \$50,000. Incorporators are Arthur E. Young, C. McClintock, J. Audley Pierce, David E. Mitchell and A. M. Slater, all of Pittsburgh, Penn.

**Indiana, Penn.**—A new coal company has been organized to operate at Dilltown, on the Cresson branch of the Pennsylvania R.R. The company will be known as the Armford Coal Co. Angus L. Walker, who has been mine foreman at the Valley Coal Co.'s mine at Leechburg for the past ten years, will be manager and general superintendent of the new company. Principal stockholders, Charles C. Ford, of Indiana; Angus L. Walker. Work on the coal tippie and the main entries of the mines has been started, and Pennsylvania workmen are putting in the siding.

## Industrial News

**Somerset, Penn.**—The Meyersdale Coal Co. last week took over two tracts of coal underlying the Fred Smith and John H. Shaffer properties near Listie.

**Santa Fe, N. M.**—Harry Springler has purchased some land near Santa Fe, and is expecting to open a mine there as

soon as proper arrangements can be made.

**Sharon, Penn.**—While Dame Rumor is the only authority for the report, it is expected that before many days the announcement will be made that Claire furnace is to be blown in.

**Woodward, Ala.**—The Woodward Iron Co. has placed an order with the Baldwin Locomotive Works, of Philadelphia, for three 100-ton locomotives, which will be the largest in the district.

**Blocton, Ala.**—The Tennessee Coal, Iron & Railroad Co. is contemplating extensive improvements on its working plant. New pump rooms in mines Nos. 1 and 2 are to be installed immediately.

**Greensburg, Penn.**—Michael G. Blank, of Hempfield township, has conveyed to the Keystone Coal & Coke Co. two tracts of land including the coal consisting of 45.38 and 87.71 acres for the sum of \$104,192.96.

**Fairfax, W. Va.**—The Davis Coal & Coke Co., a subsidiary of the Western R.R. Co., is spending \$600,000 in opening up two additional coal mines near Fairfax, W. Va., which will have a total capacity of 2500 tons a day.

**Sharon, Penn.**—Because of a scarcity of coke the Sharpville blast furnace, which was blown in recently, was forced to shut down Oct. 14. It is expected that coke will be received within a few days when the plant will resume operation.

**Duluth, Minn.**—The C. Reiss Coal Co. has bought the No. 3 Pittsburgh Docks located on St. Louis Bay, which this company has occupied for the last four years on lease. This dock is provided with four steam rigs and has a handling capacity of 350,000 tons.

**Seattle, Wash.**—As a result of the strike of coal miners in British Columbia, vessels are compelled to come to the Puget Sound bunkers for coal. Many vessels plying between British Columbia and Mexico are registered at various bunkers in Puget Sound.

**Birmingham, Ala.**—Upward of \$1,100,000 in cash will have to be provided for in a plan of reorganization of the Alabama Consolidated Coal & Iron Co., and it is probable that the preferred and common stockholders will be called upon to furnish the bulk of this sum.

**Cumberland, Md.**—Louis Stanton, of Frostburg, who some time ago purchased the property of the Georges Creek Basin Coal Co. about seven miles from Cumberland on the National Pike, the nearest coal mines to Cumberland, will organize the Stanton Coal Co., and will again put the mines in operation.

**Skagway, Alaska.**—To obtain fuel for a smelter at Skagway to be established for the reduction of copper ores, the White Pass Development Co. recently shipped from Victoria, British Columbia, a coal-mining plant for the development of a coal seam situated a short distance from White Horse on the Yukon River.

**Latrobe, Penn.**—Orders were issued Friday by the H. C. Frick Coke Co. officials to operate the old Monastery plant at Latrobe, which has been idle three years. No ovens will be fired, the coal being loaded in cars and shipped to other points. Superintendent Dowing will put a force of men to work at once.

**Scranton, Penn.**—Announcement has been made that a syndicate of New York and local capitalists have taken over the Clearview Coal Co. in north Scranton for a consideration said to be in

the neighborhood of \$200,000. One hundred men were employed at this colliery, the output of which approximated 40,000 tons per year.

**Coshocton, Ohio.**—The Ohio Cannel Coal Co. has started operations in Bedford township, four miles from Warsaw on the Dresden branch of the C. A. & C. R.R. Head office is in this city. Robert C. Mason, president; James P. Leech, vice-president and superintendent; N. A. Barnhart, general manager and consulting engineer; W. F. Wegley, treasurer, and Horace W. Blaine, secretary.

**New Bethlehem, Penn.**—J. A. Beam has just closed a contract for the cannel coal east of the Fairmount property. The mine will be opened on the Brooks farm, where the seam shows 15 ft. at the crop. The entire output has been contracted for the year 1913. Operations will be commenced within the next ten days. The company will be known as the Pine Run Coal Co., New Bethlehem, Penn.

**Wheeling, W. Va.**—The Grand Trunk R.R. Co. having purchased the Rail & River Coal Co.'s property and other valuable coal property in Belmont County, will open at least two mines probably this week, and others will follow. A third rail is to be built at once from this city to Jacobsburg, and the Pennsylvania will join to their new road, the O. R. & W., at the sand pit near Wegee, south of Bellaire.

**Nashville, Tenn.**—In order to alleviate in a measure the pressure of the car shortage in the Tennessee coal trade, Edward M. Wrenne, Assistant Superintendent of Transportation of the Nashville, Chattanooga & St. Louis Ry., with offices in Nashville, Tenn., recently secured the rush delivery of 50 new steel, under-framed coal cars from the American Car & Foundry Co., of Madison, Ill., for his road. The cars have been put into service.

**Bream, W. Va.**—The coal properties of C. D. Graham, of Charleston, W. Va., have been purchased by C. E. Specht and Geo. C. Keim, the purchase price being about \$50,000. The property includes two railroad sidings, a coal tippie, 200 mine cars, 22 miners' houses, a company store, stables, etc., together with about 800 acres of West Virginia coal. The new owners expect to increase the daily output of this mine from 1000 to 3000 tons, and will install rope haulage.

**Whitesburg, Ky.**—The Blackwood Coal Co., of Pardee, Va., in Black Mountain, will open a mine in the immediate future on Frank's Creek near Whitesburg, Ky. The Virginia company has decided to amplify its interests through mining Kentucky coal, and will locate its Whitesburg mine where it will be reached by an extension of the new Wasioto & Black Mountain R.R., a subsidiary of the Louisville & Nashville.

**Indiana, Penn.**—People's Coal Co., composed almost entirely of Johnstown men, is preparing to take over a field of several thousand acres of valuable coal and timber lands. The field adjoins lands owned by the Lackawanna Coal & Coke Co. and by the Commonwealth Coal Co. J. R. Richards, of Indiana, is testing the field, which is said to be underlaid with excellent coal beds, easily accessible for mining. Surface will be taken over for operations. The deal in which the People's company of Johnstown is interested extends from the holdings of the Lackawanna Coal & Coke Co. on the east to a point near where the Pittsburgh seam comes to the surface.



# Coal Trade Reviews

Current Prices of Coal and Coke and Market Conditions in the Important Centers

## General Review

The Eastern hard-coal dealers are becoming imperative in their demand for coal. While naturally expecting the outlying districts, such as New England and the Northwest, to receive the first consideration, they are getting so far behind, as the season advances, that the situation is becoming acute. The temporary supplies at some points have caused a slight easing off in orders, but, in general, these have not tended to lessen the anxiety over the future. Independent prices in the mining regions have reached \$1 above what is considered a good figure, and the supplies of hard coal on the docks in the Northwest are estimated at one-tenth normal for this period.

The Eastern bituminous shippers who contracted freely in the spring, are now becoming apprehensive over November and December's deliveries. There is a dearth of steam coal in these markets. The car shortage is apparent on all lines, arrivals small, and when the roads start confiscating coal, the market will probably reach panicky proportions. Production reports from all the mining districts are discouraging, while producers are evincing every confidence over the future and refusing to consider long-term contracts.

Only a few odd lots of free coal are to be found in the Pittsburgh market. The contract demand is fairly large, and sufficient tonnages have been closed to justify an advance over the circular for the year; it is believed that this new high level will shortly be the minimum. No contracts are being made for shipment before the close of navigation. In Ohio there is considerable activity in domestic, as retailers are now accumulating stocks for emergencies. Prices are firm in every particular, with persistent rumors of a further advance shortly.

At the Virginia tidewater-loading ports so many vessels have been awaiting tonnages that the situation closely resembles that in effect during the British strike; production at the mines is being seriously curtailed by the insufficiency of both cars and labor. In the South quotations have increased slightly and the output of the better grades is covered well ahead.

The producers continue in full control of the Middlewestern markets. With the exception of that moving on low-priced contracts made during the dull season last summer, quotations are ruling higher than for years, and the only trouble is in procuring tonnage.

## Boston, Mass.

Discouraging reports continue from all the bituminous districts in so far as output is concerned. Inferior coals are bringing prices far above normal for this early in the season and those shippers who contracted freely in the spring are now apprehensive over November and December. The shortage of cars is apparent all over the Eastern part of the country and on none of the standard coals are there more than dribbling shipments either all-rail or at tide.

On Pocahontas and New River there is no material change except that demurrage in increasing amounts is being paid to vessels awaiting cargoes at Hampton Roads. A small volume of spot coal has been sold in several instances at \$3.25 f.o.b. At the distributing points there is a dearth of steam coal offering of any kind and when the railroads begin confiscating for engine fuel things will be still more interesting.

Anthracite prices at retail are moving up in New England. Manchester, N. H., is among the first of the cities to reach \$10 for stove, egg and nut. Water freights on small vessels out of New York have advanced sharply, \$2 having been paid lately to a point on the Kennebec River, more than doubling the rate of 60 days ago. At many of the tide-water points there is some easing up now that temporary supplies have been had in most cases, but there is no lessening of the anxiety over futures; the pressure is bound to be stronger than ever before when the low temperatures begin to be felt. Scattering sales of premium coal are still being reported but the dealers who have been consistent in their purchases and have formed regular connections during the last few years have been able to keep going.

Wholesale quotations are about as follows:

Clearfields, f.o.b. mine.....	\$1 30@1.70
Clearfields, f.o.b. Phila.....	2.55@2.95
Somersets, f.o.b. mine.....	1.50@1.80
Somersets, f.o.b. Phila.....	2.75@3.05
Pocahontas, New River f.o.b. Hampton Roads.....	3.10@3.25
Pocahontas, New River on cars Providence.....	4.15@4.30
Pocahontas, New River on cars Boston.....	4.25@4.40
Anthracite stove, egg and chestnut, f.o.b. N. Y.....	6.60@7.00

## New York

**Bituminous**—There was an appearance of a slight easing off in bituminous during the week although this is not conceded in every instance and is certainly

not reflected in the local quotations. Coal at the mines is still being eagerly sought and readily commands from \$1.40 to \$1.50, with few sellers in the market.

It is believed that the recent sharp advance was due to the heavy buying on the part of the railroads who appear to be endeavoring to accumulate substantial surpluses. The stocks at tide are small and the requisitions slow; this business is rather light and were it in the same position as the line trade, the demand at this point would be far in excess of production. There is still a scarcity of both labor and cars in the mining region, the situation in the latter respect being particularly bad on the New York Central.

We quote the local market unchanged but ruling firm and hard as follows:

West Virginia, steam.....	\$2.95@3.05
Ordinary grades, Pennsylvania.....	2.95@3.05
Fair grades, Pennsylvania.....	2.95@3.05
Good grades, Pennsylvania.....	3.10@3.15
Best Miller, Pennsylvania.....	3.15@3.25
Georges Creek.....	3.50

**Anthracite**—There has been no change in the hard-coal situation. The arrivals are still limited and far below requirements, with no improvement in this respect anticipated until Lake shipping closes Dec. 1.

Lack of railroad equipment is not being so seriously felt as in bituminous, but is probably causing a loss at the collieries of on an average of one day per week. Mitchell Day, celebrating the termination of the strike in 1902, occurs Tuesday of next week and all the hard-coal mines will be closed. The small sizes are still easy but not in excess, and there is an increase in the demand for nut over that for egg and stove.

Local prices are firm in every respect as follows:

	Upper Ports	Lower Ports
Broken.....	\$5.00	\$4.95 @ 5.75
Egg.....	5.25	5.20 @ 6.85
Stove.....	5.25	5.20 @ 6.85
Nut.....	5.50	5.45 @ 6.85
Pea.....	3.50	3.35 @ 3.75
Buckwheat.....	2.75	2.25 @ 2.45
Rice.....	2.25	1.85
Barley.....	1.75	1.95

## Pittsburgh, Penn.

**Bituminous**—Conditions are not greatly changed in the week, and there is still practically no mine-run or screened coal on the market, except odd lots, frequently single carloads, that can be picked up. Buyers pay the fancy prices asked only in extreme need, hence the tonnage moving is quite limited. An average of about \$1.90 obtains in such transactions, for mine-run or nut.

Demand on contract for next year has been fairly large, and enough has been closed to move some of the operators to advance prices above the circular figures of the year, beginning either Jan. 1 or Dec. 1, no producers being in position to undertake contracts which involved the commencement of shipments before the end of the Lake season. Some operators have advanced prices on contract 7½c. on slack and 2½c. on other descriptions, above the circular prices, and accordingly we quote the contract market at the following range: Slack, 82½@90c.; mine-run and nut, \$1.22½@1.25; ¾-in., \$1.32½@1.35; 1¼-in., \$1.47½@1.50. Operators expect the new advance will shortly be the minimum price.

**Connellsville Coke**—Spot and prompt furnace coke, which was bringing \$2.50@2.75 a week ago, advanced so that on Friday \$3.85 was paid and on Saturday \$4, for spot, reasonably prompt shipment being possibly obtainable this week at \$3.75, though not spot. The high prices have now prevailed long enough to permit of speculation as to their cause. It is observed, first, that prompt and spot coke is bringing higher figures than ever before in the history of the trade, except when there has been an absolute railroad blockade, preventing the movement of coke, however great the supply. It is also noted that no furnace, so far as has been learned, has actually lost production through lack of coke, whereas when the product advanced to fancy prices in the past, on account of lack of transportation facilities, furnaces frequently had to bank for a day or a week at a time. From the fact that there is enough coke to go around, and also that as a rule consumers have contracts, but are not getting sufficient shipments against them, it is concluded in some quarters that the high prices are due chiefly to operators selling coke which is due on contract, the furnaces in substance "buying their own coke."

It is difficult to make contracts for first half at any price. There was a large tonnage sold some time ago at \$2.35 up to \$2.50, and two or three weeks ago some contracts were made at \$2.60 up to \$2.75, but the highest price then, has now become nominal, and there is talk of \$3. There is considerable consumption still uncovered and apparently there is a less quantity of production unsold. We quote: Prompt and spot furnace, \$3.75@4; contract furnace (nominal), \$2.75@3; prompt foundry, \$4@4.25; contract foundry (nominal), \$2.75@3.

The *Courier* reports production in the Connellsville and lower Connellsville region in the week ending Oct. 12 at 397,507 tons, a decrease of 700 tons, and shipments at 3972 cars to Pittsburgh, 6613 cars to points west and 939 cars to points east, a total of 11,524 cars, a decrease of 127 cars.

## Philadelphia, Penn.

As the season advances, conditions in this vicinity become more acute, as far as the supply of anthracite coal is concerned. Ever since the early summer, the companies have not been giving much heed to this market, and in fact, the dealers were willing to accept this position, recognizing that the outlying territories should receive first consideration, particularly the Northwest and New England markets.

Of course, considerable coal has been coming to this market during the summer, but the cool mornings and evenings of late, has made it imperative that better supplies be obtained, to meet the ever increasing demand, and the dealers are insisting that they receive consideration. Stove coal still appears to be the hardest to secure, and a large percentage of the orders are for that size. As a consequence, the individual operators continue holding to a premium of anywhere from \$1.25 to \$1.50 over the circular prices, and are having trouble in filling orders at that.

There seems to be a slightly increased demand for the steam sizes, apartment houses and the large office buildings and hotels having started up their plants, but the market is still rather slow, particularly on buckwheat and rice. Pea coal is all moving off, and what stocks the companies have will be required for the large demand which this city invariably makes for that size. Car shortage is handicapping operations at the collieries, although it is reported that the output so far this month is ahead of last year for the same period.

## Wilkes-Barre, Penn.

Coal has taken another advance and independent operators are reaping a harvest. Nut and stove sizes are being sold at \$5.35 a ton, f.o.b. the mine, an advance of \$1 over what has heretofore been considered a good price, except when a strike was on or in times of a coal famine.

Contracts, by which the producers are bound, prevent them from sharing in the advance. The large companies are obliged to dispose of their product at \$3.75 per ton and they are rushing their output to Canadian and Lake points in order to make all the shipments possible before navigation closes.

## Baltimore, Md.

The car situation, according to reliable reports, reached an acute stage during the past week, creating almost famine conditions, for a few days, in the coal trade. Deliveries, on the part of at least half a dozen companies, were well-nigh impossible, not more than one in ten being able to get half the fuel mined, through to tidewater.

As a result, prices for all grades have advanced, and are higher now than has been known in Baltimore for years. This would mean large profits for the coal men if they could get enough cars to take care of orders, but as it is some producers are actually losing money. Nearly all the companies have called in their solicitors and are not going after any new business.

As high as \$1.40 and \$1.50 was paid during the week for the low-grade coals. These were consumers who failed to stock when they could have obtained coal at lower prices, with quick deliveries. Other coals are holding firm, but the greatest demand appears to be for the low grades.

The coke market continues active, with prices up. Connellsville sold around \$3.75 during the week, while the West Virginia grade reached \$3.25 and better. A shortage of labor is being experienced in the coke trade.

## Buffalo, N. Y.

All coal is quite active, but coke and independent anthracite are going away beyond former bounds. Some members of the soft-coal trade are insisting that coke should be advanced a dollar from last week's quotations and base the claim on price circulars from the Connellsville coke district. Still the trade generally is not paying such prices and may not be obliged to, so it is probably best to confine coke advances to 50c., though it looks as if the advance would continue for some time yet.

At present everybody is quite confident over the future, and bituminous operators and jobbers are refusing to make long-time contracts at any figure that the consumers are likely to offer. The result is that all the coal not wanted on existing contracts is held for single-order business, which is at least 30c. higher than it was in the spring.

It is becoming steadily harder to quote bituminous because so many new prices come in, but the best figures obtainable are \$3 for Pittsburgh lump, \$2.80 for three-quarters, \$2.70 for mine-run and \$2.25 for slack, with coke not less than \$5.85 for 72-hour foundry and advancing rapidly. It will be some time as it appears now, before there is any stock coke on the market. The low-priced cokes are also being picked up rapidly and there are indications of a shortage in this branch.

The anthracite situation is unchanged, the dealers being as eager as ever and are even buying here at retail to ship to various points outside. Sellers of independent anthracite report that they have a more or less regular premium price over the circular of \$2.35, with prospect of going higher, though there will be an easing off as soon as the Lakes close. Shipment by lake for the week was 174,000 tons.



### Columbus, Ohio

The feature of the coal trade in Ohio during the past week has been the growing car shortage. Instead of improving, as was expected by some after the recent ruling of the Ohio Public Service Commission, the shortage is growing worse.

While the weather has been mild during the week, there was considerable activity shown in the domestic trade. Retailers are taking advantage of the lull to accumulate stocks for an emergency and as a result operators and jobbers have been receiving a large number of orders. Prices all along the list remain firm in every particular. Advances have been made in the fine grades, such as nut, pea and slack and coarse slack.

The volume of the lake trade has been cut by the car shortage and as a result the tonnage moved to the Northwest is smaller than formerly. For the week ending Oct. 18 the tonnage loaded by the Toledo docks of the Hocking Valley R.R. was 34,000 and the total amount since the opening of navigation is 2,029,306. It is estimated that during the past week the production in Ohio fields has been but 40 per cent. of normal and in certain districts even less.

Quotations in Ohio fields are:

	Hock- ing	Pitts- burgh	Pome- roy	Kana- wha
Domestic lump.....	\$1.75		\$2.00	\$1.75
2-in.....	1.55	\$1.25	1.55	1.55
Nut.....	1.25		1.50	
Mine-run.....	1.30	1.10	1.50	1.30
Nut, pea and slack.....	1.05		1.00	0.95
Coarse slack.....	0.95	1.00	1.00	0.85

### Hampton Roads, Va.

There has been a heavy drain on the Hampton Roads shippers during the past week. There has been from 10 to 25 vessels anchored here awaiting berths all week, and the situation has much the appearance it had during the English coal strike last spring. Very little free smokeless coal is on the market, only one or two sales being reported and these at \$3.50, Hampton Roads. There is some free, high-volatile coal, which is being taken up and used where ordinarily smokeless only would answer.

At the mines the shippers are encountering a bad car shortage, causing a reduction in the output of something like 32 per cent. Very few of the mines have their full complement of miners. It is hoped that the situation may improve, but as bad weather draws near this is hardly to be expected in view of the experiences of the past winters.

### Birmingham, Ala.

Hope for improved conditions in equipment for loading is given by several of the leading railroads. During the past two or three months an unusual number of cars have been used by them for storing their own fuel, in order that as much

equipment as possible might be turned into the commercial trade as the weather grows colder.

Prices on steam coal have increased slightly where rush shipment is desired, and producers of high-grade domestic coal have their books well filled for the remainder of the year.

There is an urgent demand for foundry coke and prices have advanced materially during the week.

### Louisville, Ky.

The car shortage is the only unfavorable feature in the Kentucky trade at present, but this is becoming serious, as operators can obtain cars only about half the time. This condition, coming at a time when the movement should be unhampered and with the real winter not yet in evidence, it is apparent there is scant prospect for any relief.

Prices have inclined upward strongly during the week and further advances are anticipated. Western Kentucky lump is quoted at \$1.50, f.o.b. the mines, nut, \$1.15 and mixed lump and nut, \$1.35, with mine-run \$1. Nut and slack is quoted at 75c. and slack 50c. Eastern Kentucky block is selling at \$2.25, f.o.b. the mines, with 2½-in. lump at \$2. Nut and slack are quoted at 70 to 75 cents.

### Indianapolis, Ind.

Coal prices have been advanced again and are higher than is usually the case in midwinter. Anthracite has advanced to \$9.25 and other Eastern coals in comparison. Dealers say they cannot get any kinds or grades and the railroad men state that the present advance in prices is a grab by the operators. If the consumers are patient, and order coal only for current needs the troubles will end by Christmas.

However, with the advent of cold weather the coal is moving away from the docks rapidly and this will result in increased activity to the market. Operators in Indiana admit that those who are not tied up with contracts are now obtaining unusually good prices, and indications are that they will keep up and may even go higher. With continued good weather it is believed that shipments will move out in the next few weeks, in sufficient quantities to break the coal famine.

### Detroit, Mich.

Coal prices have taken quite a jump during the past week, and the consumers who have been putting off ordering, are becoming quite alarmed. It will be almost impossible from now on until early spring to obtain coal in anything greater than two or three car-lots. Anticipating the usual fall and winter shortage of cars, and consequent congestion, it looks as though some plants will either close

for want of fuel or pay high prices for what spot shipments can be obtained. Coal of all kinds is coming in slowly, and with poor prospects for any immediate improvement.

The anthracite situation is still as tight as ever, and the price of this product is steadily advancing. The lowest retail price prevailing seems to be \$9.50, and some of the dealers in the more remote districts are asking more.

Prevailing prices are as follows:

	W.Va.	Pitts- burgh No. 8	Poca- hontas	Hock- ing
Domestic lump....	\$1.75	\$1.75	\$2.50	\$1.70
Lump and egg....	1.50	1.60		1.50
2-lump.....	1.45	1.45		1.40
Mine-run.....	1.40	1.30		1.25
Nut, pea and slack	1.00	1.00		0.95

### Chicago

Procuring supplies is the only problem before Chicago dealers. The situation is becoming more acute daily and even the most conservative dealers are sounding an alarm.

It is conceded that the Western coal operator now has the Chicago market to himself. The smokeless producer has only enough to satisfy his contracts, and this has caused spot prices to advance rapidly. It is easy to find lots of five and ten cars of smokeless lump and egg selling at \$2.65@2.75. Some sales have been made on the basis of \$3 a ton, f.o.b. the mines, which means \$5.05, f.o.b. Chicago, the highest price on this market in years.

While there is a demand for fully 100 cars of Hocking per day, receipts on the average are only about nine cars, which is not enough to satisfy contracts. This is due to the Hocking operators committing themselves so heavily to the Lake trade.

The Illinois Central is unable to supply enough equipment to meet the demand and the same applies to the Burlington and the Chicago & Eastern Illinois lines. At the annual meeting of stockholders of the Illinois Central road, Oct. 16, a resolution was passed directing officers of the road to purchase 6000 more coal cars.

Most of the industrial concerns are working overtime and screenings, as a result, sell at exceptionally good prices. The demand for coke continues to be heavy. The reason is a scarcity of both labor and cars.

Prevailing prices at Chicago are:

	Sulli- van Co.	Spring- field	Clinton	W. Va.
4-in. lump.....	\$2.87			
Domestic lump.....		\$2.82	\$2.77	\$4.55
Egg.....	2.87		2.27	
Steam lump.....		2.12	2.17	3.65
Mine-run.....	2.32@2.42	1.97		
Screenings.....	1.52@1.57	1.32	1.52	

**Coke**—Prices asked for coke are: Connelville, \$5.60@5.75; Wise County, \$5.35@5.50; byproduct, egg and stove, \$5.35@5.50; byproduct, nut, \$5.25; gas house, \$5.25@5.40.



## Minneapolis—St. Paul

Should a cold wave strike this territory and last for any length of time, the great storage docks at the head of the Lakes would soon be exhausted. According to local dockmen there are not more than 150,000 tons of all grades of anthracite in storage at the present time. Normally at this time of the year there is from a million to a million and a half tons of anthracite stocked on the docks. There is a fair supply of soft-coal but even that is far below normal and some companies are entirely out of hard-coal.

Early in the summer some of the big dock companies went after business aggressively, signing contracts at quite low figures and with the demand and prices of today are beginning to realize their mistake.

It is rumored that some dealers are offering as much as 25c. to 50c. premium on coal in transit. Steam business here is slow, the buyers holding off till in actual need. Prices on hard-coal, delivered in Minneapolis and St. Paul are as follows: Grate, \$9; egg and stove, \$9.25; nut, \$9.50; pea, \$8; buckwheat, \$6.25. Soft coal delivered: Youghiogeny lump, \$5.75; dock-run, \$5.45; screenings, \$4.50. Hocking lump, \$5.75; dock-run, \$5.35; screenings, \$4.50. Smokeless egg, \$8; mine-run, \$5.50; screenings, \$5.

## St. Louis, Mo.

St. Louis has a declining market, although weather indications are that the latter part of the week may see an advance. The first rush of orders has been practically taken care of in a domestic way, and from this time on there will be a gradual lull in the demand for this grade.

The demand from the country is rather good right now, especially from the South, and steam business is normal. St. Louis proper is suffering from a scarcity of anthracite, the local dealers being between four and five hundred cars short.

The prevailing prices are:

Carterville and Franklin County		
6-in. lump	\$2.00@2.15	
36 egg	1.85@2.00	
No. 1 nut	1.50@1.65	
No. 2 nut	1.40@1.50	
2-in. screenings	0.65@0.75	
Mine-run	1.20@1.25	
Murphyboro Big Muddy		
Lump and egg	\$2.25	
Trenton		
Lump and egg	\$2.40	
Mount Olive		
6-in. lump	\$2.00	
2-in. lump	1.75	
Standard		
6-in. lump	\$1.40@1.50	
2-in. lump	1.20@1.30	
Screenings	0.25@0.35	

There has been no change in the price of washed coals, and coke remains firm at \$5 for both the byproduct and gas house.

## Production and Transportation Statistics

## SAULT STE. MARIE CANALS

Coal movement through Sault Ste. Marie Canals for the season to Oct. 1, as compared with the same period last year in short tons:

	1911	1912
Anthracite	1,485,087	1,321,452
Bituminous	10,079,890	9,544,129
Total	11,564,977	10,865,581

## THE CAR SITUATION

The freight-car census taken on Oct. 10, showed that the net shortage of cars had almost doubled in the fortnight, but that the situation was still far from being as bad as that which prevailed in the fall of 1907, the last year in which conditions were similar to those now prevailing.

The following table shows the surplus and shortages of cars on 179 roads on Oct. 10:

	Surplus	Short	Net Surplus
Box	4,701	32,749	*28,048
Flat	1,079	4,076	*2,997
Coal, gond. and hopper	6,491	14,897	*8,406
Other kinds	10,530	2,667	7,872
Total	22,810	54,389	*31,579
*Shortage.			

On the corresponding date last year the net surplus of idle cars was 35,897. Two years ago it was 33,735; in 1909, 12,546 and in 1908, 101,837.

## ANTHRACITE SHIPMENTS

The following is a comparative statement of anthracite shipments for September, 1911-12, and the totals for the first 9 months of the current year, in long tons:

	1912	1911	9 Mos.
Phila. & Reading	1,184,594	1,056,542	8,950,472
Lehigh Valley	1,168,649	1,094,704	8,287,807
Cent. R. R. N. J.	691,253	760,329	5,830,831
Del. Lack. & West.	835,316	849,444	6,354,946
Del. & Hudson	379,792	616,169	4,536,977
Pennsylvania	321,741	459,763	3,948,019
Erie	683,026	730,130	5,303,084
Ont. & Western	212,125	193,854	1,623,083
Total	5,876,496	5,730,935	44,835,219
9 Months, 1911			51,376,379

## VARIOUS RAILROADS

The following is a comparative statement of the fuel movement over various railroads, for the seven months ending July, 1911-12:

Railroads	1911	1912
Baltimore & Ohio <sup>1</sup>	18,977,604	22,924,745
Buffalo, Rochester & Pittsb. <sup>2</sup>	4,537,567	4,859,669
Buffalo & Susquehanna <sup>3</sup>	1,122,144	963,870
Chesapeake & Ohio <sup>4</sup>	7,465,698	9,059,341
Erie <sup>5</sup>	3,999,967	3,451,300
Hunt'g. & Broad Top Mt. <sup>6</sup>	629,433	644,181
N. Y. Central & Hudson River <sup>7</sup>	4,638,927	4,463,247
Norfolk & Western <sup>8</sup>	11,146,791	13,905,052
Penn. (East of Pittsb. & Erie) <sup>9</sup>	36,044,761	39,151,518
Pittsburgh & Lake Erie <sup>2</sup>	8,650,403	9,686,551
Pittsb., Shawmut & Northern <sup>2</sup>	814,731	1,079,363
Southern <sup>4</sup>	1,850,329	2,112,647
Virginian <sup>5</sup>	1,436,582	1,997,385
Western Maryland	1,534,533	1,702,950

<sup>1</sup>Figures throughout this table have been reduced to a uniform basis of short tons.

<sup>2</sup>Includes coal received from connecting lines.

<sup>3</sup>Includes company's coal.

<sup>4</sup>June and six months' figures.

<sup>5</sup>Does not include company's coal hauled free.

## IMPORTS AND EXPORTS

The following is a comparative statement of imports and exports in the United States for the first 7 months or 1911-12, and for July of the current year, in long tons:

	7 months		July
Imports	1911	1912	
Anthracite	1,986,431	1,645,892	514,645
Bituminous	755,301	869,403	114,698
Exports			
Anthracite	1,986,431	1,645,892	514,645
Bituminous			
Canada	5,134,007	5,367,821	1,372,490
Panama	305,624	289,825	32,358
Mexico	343,142	210,786	19,737
Cuba	575,590	646,462	84,125
West Indies	313,085	447,769	54,355
Other countries	368,521	1,114,514	105,347
Total	7,039,969	8,077,177	1,668,412
Bunker Coal	3,296,619	4,319,514	597,011

## Foreign Markets

## BELGIUM

The following is a comparative statement of fuel imports and exports in Belgium for the first 8 months of the years 1911-12, in tons:

	Imports		Exports	
	1912	1911	1912	1911
Coal	5,286,686	4,851,585	3,304,650	3,486,023
Coke	605,985	447,138	648,156	667,274
Briquettes	285,086	245,155	431,658	329,445

## AUSTRIA-HUNGARY

The following is a comparative statement of fuel imports and exports in Austria-Hungary for the first six months of the years 1911-12:

	Imports		Exports	
	1911	1912	1911	1912
Coal	4,924,545	5,655,023	288,349	324,292
Lignite			3,560,977	3,454,895
Coke	3,802	420,847		

## GREAT BRITAIN

Oct. 11—A more active tendency is noticeable, but supplies of large are still abundant for prompt loading. The docks are well filled with tonnage, and sellers are anticipating that much better conditions will rule in the near future. For early loading, quotations are approximately as follows:

Best Welsh Steams	\$4.02 @ 4.08
Best Second	3.84 @ 3.96
Seconds	3.66 @ 3.78
Best Dry Coals	3.84 @ 4.08
Best Monmouthshire	3.60 @ 3.66
Seconds	3.42 @ 3.48
Best Cardiff Smalls	2.46 @ 2.52
Seconds	2.40 @ 2.46

The prices for Cardiff coals are f.o.b. Cardiff, Penarth, or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both exclusive of wharfage, and for cash in 30 days—less 2½%.

British Exports—The following is a comparative statement of the British exports for September of the current year and the first nine months of 1911-12:

	Nine Months		
	September	1911	1912
Anthracite	237,015	1,762,204	1,770,490
Steam	4,439,596	34,735,081	32,810,201
Gas	963,176	7,743,871	7,755,023
Household	154,705	1,098,581	1,146,393
Other sorts	283,067	2,278,953	2,268,316
Totals	6,077,559	47,618,690	45,750,423
Coke	97,679	711,697	680,713
Patent Fuel	125,373	1,236,582	1,115,631
Coal, Coke, & Pat. Fuel	6,300,611	49,566,969	47,546,767

# Financial Department

Annual Reports, Notes and Comments on the Various Coal Securities

## The Philadelphia & Reading Coal & Iron Co.

The following is a summary of the annual report of this company for the fiscal year ended June 30, 1912, issued under date of Oct. 14, 1912:

The total production of anthracite coal from the lands owned, leased and controlled by the Philadelphia & Reading Coal & Iron Co. for the year ended June 30, 1912 was 10,098,831.02 tons, as compared with 10,762,796.18 tons mined during the previous year, a decrease of 663,965.16, or 6.17 per cent.

During the year the company mined 8,671,013.00 tons, a decrease of 354,601.03 tons, or 3.93 per cent; purchased 641,272.00 tons, a decrease of 187,394.17 tons, or 22.61 per cent., and sold 10,194,690.02 tons, an increase of 100,223.08 tons, or 0.99 of one per cent., as compared with the previous year, the increase being entirely in the low-priced coals.

The decrease in the tonnage mined during the fiscal year resulted from the suspension of mining from Apr. 1 to May 20, ordered by the United Mine Workers of America. A new agreement was entered into, covering a period of four years, until March 31, 1916.

The cost of coal mined and purchased during the year was 8.5c. per ton higher than for the previous year, and the price realized on all sizes was 10.8c. per ton higher.

The total sum expended for improvements during the year and charged to expenses was \$839,742.00, as against \$1,139,040.88 the previous year.

The Philadelphia & Reading Collateral Sinking Fund Loan has been reduced by the payment of \$30,000.00, for which this company has been reimbursed by the Reading Company.

The increase of receipts from the sale of anthracite over last year was \$1,325,755.37; the increase in receipts from sale of bituminous and from other sources was \$17,766.97, making an increase in gross receipts of \$1,343,522.34 as compared with previous year.

The increase in expenses, excluding the amount expended for improvements, amounted to \$939,227.23.

Cost of transportation of coal by rail and water during the year was \$7,700,695.75 as compared with \$8,255,535.20 for the previous year.

The cost of maintenance and repairs increased over last year \$130,885.07; the cost of mining increased \$56,738.89.

The following is a comparative statement of the income account, for the two years ended June 30, 1911 and 12:

	1912-11	1911-1910
Receipts	\$34,021,026	\$32,695,270
Coal sales (anthracite).....	1,186,203	1,152,915
Coal sales (bituminous).....	248,717	298,721
Coal rents.....	131,072	131,061
House and land rents.....	116,283	95,140
Interest and dividends.....	30,349	17,021
Miscellaneous.....		
Total receipts.....	35,733,652	34,390,130

### Expenses

Mining coal and repairs.....	18,382,202	18,194,578
Improvements.....	839,742	1,139,040
Coal purchased (anthracite).....	1,618,008	1,906,678
Coal purchased (bituminous).....	1,100,315	1,070,565
Royalty of leased collieries.....	458,522	510,686
Transp. of coal by rail.....	6,704,904	7,114,995
Transp. of coal by water.....	995,791	1,140,539
Handling coal at depots.....	434,451	483,037
Taxes on coal lands, etc.....	589,728	456,018
Improvements (houses).....	32,862	78,349
Damages account coal dirt.....	6,309	4,971
All other expenses.....	1,086,331	1,082,850
Coal sold from stock.....	2,363,317	790,297

Total expenses..... 34,612,537 33,972,609

Profit in operating..... 1,121,114 417,520

Fixed charges and taxes..... 85,455 80,598

Interest on Reading Company loans..... 864,083 375,572

Interest on Tremont Coal Co. Bonds matured—amount advanced..... 58,666 520,837

Profit..... 171,575 \*103,316

Profit of previous years..... 1,288,118 1,391,435

Balance to credit of Profit and Loss Account..... 1,459,694 1,288,118

Tonnage

Mined..... 8,671,013 9,025,614

Purchased..... 641,272 828,666

Sold..... 10,194,690 10,094,466

On hand..... 242,332 1,088,722

\*Loss

### BALANCE SHEET TO JUNE 30, 1912

#### Debit

Capital Accounts	Amount
Coal lands.....	\$49,397,659
Timber lands.....	841,690
New York and Eastern depots.....	839,539
Western yards and depots.....	1,736,979
Miners' and other houses.....	553,137
Pottsville shops, real estate and improvements.....	391,462
Storage yards and washeries.....	851,892
Other real estate.....	388,425
Improvements and equipments at collieries.....	12,959,224
Stocks and bonds of and loans to companies controlled.....	9,863,914
	\$77,823,926

#### Current Assets

Cash on hand.....	\$2,692,617
Bills receivable.....	2,832
Coal accounts.....	3,221,693
Rent accounts.....	24,164
Companies and individuals.....	796,145
Coal on hand.....	776,701
Supplies and materials on hand.....	1,236,240
Total.....	8,750,395
Stocks, bonds and mortgages.....	73,201
	\$86,647,523

#### Credit

Capital Accounts	
P. & R. Collateral Sinking Fund Loan, 1892-1932.....	\$1,110,000
Capital stock.....	8,000,000
Reading Company.....	73,466,529
Current Liabilities	
Pay-rolls and vouchers.....	\$1,033,421
Due for coal purchased.....	182,953
Due for royalty on coal mined.....	142,136
Freight and tolls due foreign roads.....	40,836
Companies and individuals.....	266,042
Interest due and uncollected.....	20
Interest and taxes accrued.....	260,149
Total.....	1,925,559
Miners' Beneficial Fund.....	37,869
P. & R. Railway Co. Current Account.....	647,870
Profit and Loss to June 30, 1911.....	1,288,118
Profit and Loss July 1, 1911 to June 30, 1912.....	171,575
	1,459,694
	\$86,647,523

## Financial Notes

### COAL SECURITIES

The following table gives the range of various active coal securities and dividends paid during the week ending Oct. 12:

Stocks	Company	High	Low	Last
American Coal.....		85	85	
American Coal Products.....		94	94	94
American Coal Prod. Pref. 111		111	111	111
Col. Fuel & Iron.....		42	40	41
Consolidation Coal of Md. 104		104	103	
Island Creek Coal.....		88	88	88
Lehigh Valley Coal Sales.....		260	250	
Pittsburg Coal.....		25	23	23
Pittsburg Coal Pref. 96		96	95	96
Pond Creek.....		23	23	23
Reading.....		178	174	176
Reading 1st. Pref. 90		90	90	90
Reading 2nd. Pref. 97		97	96	96
Virginia Iron C. & C. 67		67	67	67
Westmoreland Coal.....		81	81	

Bonds	Company	Closing Bid	Asked	Weeks Range or Last Sale
Colo. F. & I. gen. sfg 5s.....		99		98 Sept. '12
Colo. F. & I. gen. 6s.....		108	108	107 June '12
Col. Ind. 1st & coll. 5s. gu. 84		Sale	83	84
Cons. Ind. Coal Me. 1st 5s.....		84	85	85 June '11
Cons. Coal 1st and ref. 5s.....		93	93	93 Oct. '12
Gr. Riv. Coal & C. 1st g 6s.....		97	96	102 Apr. '06
K. & H. C. & Co. 1st sfg 5s.....		97	98	98 Oct. '12
Pocah. Con. Coll. 1st sfg 5s.....		85	88	86 Sept. '12
Tenn. Coal gen. 5s.....		101	101	101
Birm. Div. 1st consol. 6s.....		102	103	103 Sept. '12
Tenn. Div. 1st g 6s.....		102	103	102 Oct. '12
Cal. C. M. Co. 1st g 6s.....		103	110	110 Jan. '09
Utah Fuel 1st g 5s.....				
Victor Fuel 1st sfg 5s.....		85	85	85
Va. I. Coal & Coke 1st g 5s.....		97	97	97

Dividends Div. Period Payable

Reading Co..... 1% Q Dec. '12

New Central Coal..... 2% — Nov. '12

**American Coal Products Co.**—The \$1,250,000, 5% serial gold, coupon notes of this company have been called for redemption and will be paid at the Guarantee Trust of New York at par and interest.

**Utah Company of Maine.**—It is said that by the year of 1914 this company will have increased its production to a point where they will be earning at the rate of \$1,500,000 yearly, and that within three years of that date the net profit will be at least \$3,000,000 per annum.

**Colorado Fuel & Iron Co.**—The recent sharp advance in the preferred stock of this company lends color to the belief that the accumulated back dividends, which now total about 72% will be paid off in the not distant future. There are \$2,000,000 of the preferred outstanding which cannot be retired by the company, and the back dividends call for approximately \$1,140,000.

**Lackawanna Coal & Lumber Co.**—This company has invested about \$500,000 in cash in the improvement of the plants of the Paint Creek Collieries Co., which it is operating, and plans the expenditure of an additional \$500,000 during the coming year. A modern tipples has just been completed and additional electrical equipment is being installed which will bring the capacity of the mines up to about 3,000,000 tons per year. The lumber company has also developed the selling organization of the collieries company, establishing new offices and yards for distributing the output.